

SOIL REMINERALIZATION

A Network Newsletter

Volume IV, Number 15 - 16

FALL - WINTER 1989

"Doing a pot test is the most convincing argument I know of. Anybody can do it. There are testing laboratory grinders everywhere. There is no lag time. In 6 hours you can get a microorganism population explosion. Taking some 6" clay pots, I filled them with a 50-50 mixture of earth and peat and 3 heaped tablespoons of dust. The results were astonishing!"

John Hamaker



Soil Remineralization

A Network Newsletter

The newsletter is a reflection, forum, round table of ideas, experiences and research of those concerned with networking and implementing soil remineralization. Articles, letters, and photos are welcome and appreciated. It reaches an emerging grass roots community network around the world.

Microorganisms produce the protoplasm of all living things. Microorganisms themselves feed on the total mixture of minerals and gases in the biosphere and are energized by carbon. We can build enormous per acre tonnages of protoplasm into the soil in a very short time—enough so that sun energy reaching the plant becomes the limit of growth. The foods of microorganisms are the cheapest raw materials on earth.

John Hamaker
The Survival of Civilization

Eden or Ice Age— Which Will We Choose?

The book *The Survival of Civilization* by John Hamaker and Don Weaver is regarded by a growing movement worldwide as a blueprint for the survival of the earth, restoring ecological balance and, perhaps, even recreating Eden.

The remineralization of forests, farms, orchards and gardens with glacial gravel and rock dust is nature's way to regenerate and fertilize soils. During an ice age, as glaciers grind rock to a fine dust over millennia, a fertile soil is created. Adding finely ground gravel dust is a tremendous boost to organic agriculture and can make it truly viable by adding up to a hundred trace minerals and elements needed by all life and by nourishing the microorganisms in the soil, whose protoplasm is the basis of all living things.

There is evidence to suggest that as forests begin to die off worldwide, giving off carbon dioxide, the climate of the earth is altered, triggering the transition from the warm interglacial to an ice age. We are hastening this process with the burning of fossil fuels.

Undertaking the task of remineralization is urgent to restore our agricultural soils and to save the dying forests in the temperate latitudes and stabilize our climate.

Soil Remineralization, A Network Newsletter

is available for \$12.00 (\$15.00 for first class U.S. postage or for international subscriptions), 3-4 issues a year from Joanna Campe, 152 South Street, Northampton, Massachusetts, 01060 U.S.A.

Features

Remineralization begins at home by Dan Hemenway.....	6-9
Rock Dusters of Clessen Brook by Caroline Wurtz.....	10
NEPA keynote address by Andrew Euston.....	12-14
A review of <i>Secrets of the Soil</i> by Frederick Scott, Jr.....	25

International

SR Primer from the Snowball Plea.....	4-5
SR with Marl and Clay by Ekhart Stoyke.....	11
Keith Gray in New Zealand.....	16-17

In the U.S.

Green Platform on SR.....	15
The SR Project by Bertram Cohen.....	17
New, Used, and make your own grinders by Jan Brewer.....	19
Letter to Grinder Industry by Piet Bouter.....	19
Maine Seaweed offer.....	19

Regular Features

U.S. Gravel and Rock Dust Sources.....	18
Letters and Forum.....	20-25
Network Listing.....	26
Subscriptions 1990.....	27

The Survival of Civilization (\$12.00) and *The Solar or Ice Age? Bulletin* (\$5.00 donation) can be ordered from Hamaker-Weaver Publishers, P.O. Box 1961, Burlingame, CA 94010

On the Cover:

Dan Hemenway showing off a tall catalpa plant in the garden of Christian and Joanna Campe. See *Remineralization begins at home* on page 6.

In This Issue

In response to an S.O.S.!

Thank you all for a wonderful response to my HELP! letter for **SR**. I received much encouragement to continue, offers for proofreading, some gravel dust scouting, a suggestion/preliminary drawing for a logo and most important for continuing the newsletter, a future co-editor! Next issue you'll have an opportunity to meet Davina Colvin. She has previous experience publishing a newsletter and will bring her talent, dedication, and concern for climate/remineralization to **SR**. She lives in Santa Monica, California so it will be a coast to coast partnership which should work smoothly with the help of a Macintosh and a modem. Instead of a one woman orchestration, producing the newsletter will be a duet with some very helpful background music. Of course the content of the newsletter is a reflection of its readers. Thank you for those contributions that keep coming and your letters which fill over 5 pages of this issue. The **Letters and Forum** section continues to be international and intimate at the same time, a community grapevine.

A new subscription policy

A big change taking place is the transition from calendar year to individually renewed subscriptions. Thanks to Wes Brown a better data base is being put together that will facilitate this and will hopefully be more convenient for subscrib-

ers. This means that the newsletter will no longer be a quarterly, not that it ever succeeded in being one! In the last four years, it has always been 3 issues with a double issue at the end of the year and the size of the newsletter has generally grown in length. You will receive a request to renew when you have received your third issue. *This time, about 95% of subscribers are due to renew and no notice will be included so please send in the form on page 27 with your subscription.* And I would like to encourage you to add yourself to the network listing even if you have done so in the past.

The much awaited **Solar or Ice Age? Bulletin** is ready to be sent to you. In order to send out further mailings your help is requested. Please send a minimum donation advance of \$10.00 for the 366 page Bulletin to publisher and editor Don Weaver, P.O. Box 1961, Burlingame, CA 94010 USA. Funds are urgently needed.

A first for this issue- a report on my own garden through the eyes of permaculturist and TIPSYPublisher/editor Dan Hemenway. The garden was landscaped in the fall of 1984 by Erik Van Lennep and many more trees were added in 1985. In visits since that time Dan Hemenway has observed the garden with a sensitive eye.

There are also current remineralization studies undertaken by Ekhart Stoyke in Canada and Keith Gray in New Zealand.

Instead of the basic primer, the art of remineralization is described by Betsan Coats and Barry Slogrove from the audio tape, **The Snowball Plea**. The tape is beautifully done and highly recommended.

At seemingly different and yet, in this case, similar ends of the political rainbow, both the Greens platform and a visionary keynote address by Andrew Euston of H.U.D. at the 20th anniversary of the National Environmental Policy Act 1969, advocate remineralization.

Remineralization projects abound from the grassroots variety to the aim of reaching corporate business leaders, from **The Rock Dusters of Clesson Brook** to **The Remineralization Project** of Bertram Cohen. There is also expanded news on gravel sources and grinders.

I would like to thank Wes Brown and Piet Bouter. Without their help this issue would be getting out to you a month later! A thank you also to Leslie Giffen and the many hours she has contributed to the newsletter, expanding the mailing list for **SR**. Thanks to husband Christian for his great patience and support. And thank you dear friends and readers!

Joanna Campe

Making paper without cutting forests by Dan Hemenway

We cut forests to make paper. Removal of substantial amounts of biomass destabilizes both fragile tropical rainforests and temperate forests weakened by long-term ecosystem and destruction and declining under current pollution and climatic shifts. Most paper serves trivial or destructive functions. (e.g. newspapers, packaging, disposable dishes.)

Avoiding most paper usage, re-using paper products as many times as possible, and manufacturing "recycled" paper are obvious and frequently discussed components of a solution to deforestation for paper. For constructive uses of paper, alternative sources of fiber can substitute eventually for cutting of forests.

Since most paper is used in urban settings, it is appropriate that we require cities to grow their own paper fiber. This can be done through biological sewage treatment plants, which can also produce energy and food. Toxic sewage can supply nutrients and water for growing fiber while more wholesome wastes can drive food production systems. Sewage treatment fiber farms would basically resemble marsh ecosystems, with emergent plants (e.g. cattails and phragmites) and floating plants (e.g. water hyacinth) cleansing water directly. This works. A system resembling raised beds or delta sandbars called chinampa can support trees (e.g. hybrid poplar and willow) growing biomass suitable for a flexible mix of energy and fiber uses, and possibly animal feed. Reeds, in particular, yield high quality paper. Since paper mills require large amounts of water which must be treated, location of the paper mill at the sewage treatment plant permits immediate re-use of cleansed effluent and on site treatment of waste

water from the paper mill. Methane and possibly biomass energy from the sewage plant can help power the mill. Re-cycled paper also can be made on this site incorporating the new fibers produced to the extent necessary for the quality of paper desired.

In warm climates, water hyacinth may prove suitable for paper manufacture if it is processed right at the sewage plant. (High water content makes it too expensive to transport.) Bamboos and many other fast growing woody plants will thrive on the chinampas producing far more biomass than in temperate situations. Bamboo makes the best paper. Alternate treatment systems, e.g. mangroves in lagoons, may be substituted or added to features sketched above.

Many regions can make paper from fiber presently wasted. For example, banana fiber produces superior papers, including many speciality art grades. Banana plants must be cut anyway to harvest fruit and stimulate new production. Cane bagesse makes paper adequate for many uses. Improved use of solar energy and wind energy in cane mills spares bagesse from burning. Bagesse from one mill will yield a lot of paper fiber.

Each region needs to assess its potential for fiber farming and fiber recycling. In all cases, remineralization should be tried to determine if sewage treatment and/or fiber production are enhanced thereby. Meanwhile, everyone can contribute to breaking deforestation by minimizing paper use.

*These systems have been designed as ecologically integrated and environmentally constructive components of healthy ecosystems or for healing ill ecosystems. Inquiries and discussion of details are invited. Many people's thinking contributed to this sketch.

The Snowballing Plea To Save The World Environment

This "Snowball" plea from Earth Repair Action asks for a new ethic in our relationship to the Earth, a World Conservation ethic which stresses the vital importance of environmental values as set forth in the book "Our Common Future". The plea recognizes "trees as the saviors of life on earth" with a program that would protect rainforests, reforest and utilize remineralization, and stresses the rights and survival of forest dwelling peoples, and much more. With alarming facts are set forth practical suggestions we can all pursue as individuals for those who wish to respond.

The History of Remineralization

Here is some information about the remineralization of the soil with fine ground rock dust. The story of remineralization is age old but now it has a new beginning. Rocks, of various mineral content, ground fine by glaciers, provide the remineralizing action of Nature herself as glacial waters clouded with rock particles gush from mountain heights upon the land below and flood the valleys and deltas each year making them perennially fertile. For centuries canny growers have realized this and have used stones, rock gravel and slate as the foundation fertilization of fields, vineyards and plantations. Julius Hensel's message in his book **Bread from Stones** written in Germany at the end of the last century was that we could do what the glaciers do and have perennially fertile land, using "Gesteinmehl", rock-dust to fertilize the land.

In Switzerland during the last 40 years various fine ground mixes of igneous metamorphic and sedimentary rock have been available to growers. In 1982 John Hamaker, assisted by Don Weaver, gave the results of his many years of laborious trial and testing in the book **The Survival of Civilization**. He drew attention to the depletion of minerals in the soils of the earth which are not watered from glaciers, and to the link between the condition of the soil and the climate. He emphasized that as it is now 10,000 years since the last ice age, minerals have leached from the soil to a greater or lesser extent almost everywhere. Because of this, trees, even forests, are suffering from malnutrition rendering them susceptible to disease, pollution and acid rain.

There is nothing new about remineralization! The only thing that is new is that we now have the technology which enables us to do what the glaciers do and supply fine rock powder for the regeneration of the earth.

What does it do? There is plenty of evidence of rock dust's revitalizing effect. We have heard Charles Peaty say that a natural source of manure "fine mineral quarry dust from a granite source is excellent".

This is because it:

- Feeds the micro-organisms in the soil;

- Causes sturdier and faster growth, and larger plants;

- Increases the root systems considerably;

- Greatly increases the nutritive value of crops, fruit and vegetables, and improves the individuality of their tastes;

- Increases the capacity of the plant to withstand extremes of climate;

- Appears to develop immunity in the plant to disease and to pests which do not seem to attack remineralized plants;

- Increases the resistance of the plant or tree to pollution and acid rain.

Saving dying forests

Dr. Gernot Graefe and Dr. Maria Felsenreich have been saving many hectares of dying Austrian forest with rock-dust. Dr. Felsenreich writes: "Fighting pollution should be supplemented by remineralizing soils and in doing so we make much use of rocks, the basic material for the build-up of eco-systems." They supply exactly what nature needs to recover and guarantee longevity for farmlands and forests. They use various mixtures of rock-dust with BIOVIN, an organic fertilizer; recycled from the remains of grapes used in wine-making. Mountain ranges and glacial areas such as the Alps, the Himalayas, Siberia, Alaska, the Andes, provide an almost endless and varied supply of natural fertilizer." Remineralization by increasing the speed of revegetation can help counteract the imbalance in the climate and maintain its stability.

Keith Gray's Results

Keith Gray, the rector of the Panorama Gardens, Rotorua, New Zealand, has researched and experimented with various types of rock and has found the results of using them very encouraging including the accelerated growth of

young trees, stronger growth and immunity to disease in plants generally. Farmers, fruit and nut growers, planters and foresters, gardeners can all discover the benefits of remineralization.

Guidelines from Barry Slogrove on how to remineralize

Barry Slogrove—Human + Environmental Ecologist—specializing in soil remineralization with an international agricultural organization shares with us some guidelines:

"Soil remineralization is an essential requirement for the continued production of food and fibre. The two raw materials which society needs to sustain itself and without which it cannot survive. The principal objective of soil remineralization is to re-establish biologically active soils in all countries. The general approach outlined aims at duplicating and accelerating the progress by which nature produces topsoil through the interaction of organic matter, soil micro-organisms and rock dusts. The ready availability of the rich cross section of minerals found in the fine ground rock dust stimulates micro-organisms, activity and reproduction hence a rapid increase in soil humus. It is important at the outset to fully appreciate that the methods outlined are extremely unlikely to result in excesses of any elements in the soil and therefore there is little danger in applying the methods and rates recommended. However, care still needs to be taken when working with clay to clay loam soils when it is advisable to begin with smaller quantities of fine rock dust and organic matter. The rule with these soils is 'a little and often', until the soil structure and hence its aeration and drainage are re-established. Too much, too soon would create a bog.

"The two essential requirements for rock dust to achieve the optimum effect is firstly, a biologically active soil compost and secondly, a soil or compost that is at least slightly acid, the condition necessary for soil, compost or root acids

THE SNOWBALLING PLEA TO SAVE THE WORLD ENVIRONMENT

THE WAY OF HOPE FOR ALL ON PLANET EARTH

Practical Suggestions

Max Lindegger
Permaculture – opportunities
for the future
56 Isabella Avenue, Nambour,
Queensland 4560 Australia

B HELPFUL INFORMATION

given by
Charles Peaty B.Sc. (For)
Planting in Arid Land. Rain 250mm p.a
All Forest Tree Services Pty Ltd
8 Clive Street, West Perth,
W. Australia, 6005.
Betsan Coats & Barry Slogrove
Remineralisation with Rock Dust
P.O. Box 77, Cotton Tree,
Qld. 4558 Australia.
Digby Jakeman on Biodynamics
apply the Biodynamic Association
Powelltown P.O. - Vic. 3797 Australia.

THE SNOWBALLING PLEA TO SAVE THE WORLD ENVIRONMENT

“SNOWBALL” P.O. BOX 200, COTTON TREE
QUEENSLAND 4558, AUSTRALIA. FAX (071) 43 6158

JOIN THE GRASS-ROOTS SNOWBALLING ACTION!

Use this tool for spreading awareness with least possible delay.

Listen and support the objectives of “The Snowballing Plea to save the World Environment” which is part of the United Nations Association of Australia’s ERA, Earth Repair Action decade.

It invites you to support the Snowballing Plea’s aim of uniting in one global voice, organisations, NGO’s, groups and individuals in many countries, in many languages to urge the United Nations, all governments and peoples, transcending national interests, to set in motion essential world-wide co-operative measures to restore the earth.

SPEAKERS in order of time given: Betsan Coats, Callum Coats, Franklin Scart (Director of the Earth Repair Foundation)

Recording given by Mungo Coats, Forest Glen Sound, Forest Glen, Bulderim 4556, Queensland, Australia.

Grateful Thanks to those giving time, expertise and funding.

to be able to etch out of the soil, the essential elements as and when required.

“As in Nature, rock dust needs to be used as the major ingredient in all organic systems of agriculture, to guarantee a full range of all the essential elements in whatever fertilization programmes are used. In forest conditions where the ground is already biologically active, rock dust can be applied directly to the soil without also applying compost. The same would be the case with any biologically active soils whether they be fields, orchards or home gardens. When the soils are impoverished and not biologically active, either incorporate the rock dust with compost before applying, or apply immediately after the compost to maximize the value of each.

“Bio-dynamic and many other types of organic farmers use rock dust in the production of compost, however, to maximize the value of compost when applying to already impoverished soils, additional rock dust needs to be used at the rates recommended hereafter.

“What is offered are two lines of approach, one for the home gardener, the other for more extensive acreages. In the case of the home gardener, firstly observe the responses from the rock dust applications to your garden before considering applying lime. Applying the latter would be highly undesirable in soils that are

neutral, almost neutral or already alkalined. In the case of larger acreages and forestry departments, it would be best to firstly have a complete analysis, that is a soil audit done before beginning. If the soil should be extremely acid, then apply sufficient lime to raise the pH to somewhere between 5.5 and 6.

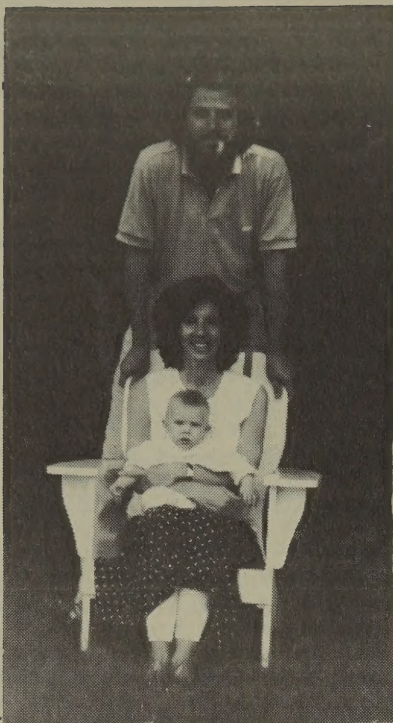
“The brief outline which follows covers the main aspects of using ground igneous and other naturally occurring rocks as the prime ingredients to replenish minerally impoverished soils, ensuring their continued fertility.

“Firstly, one should resource the quarries as close as possible to the property you wish to remineralize. Find out the source of rock dust and also the degree of fineness which is obtainable. The most desirable for general use is the igneous rock dust of the basalt or granite group. The finer the dust, the less would be required and the more rapid the improvement in the soil’s productive potential.

The following rates of application are offered as a general guideline and are based on rock dust with approximately 25% smaller than 75 microns. In other terms 100 mesh. Any quarry should be able to tell you whether their rock dust meets this requirement and if not how to achieve it. What follows are the rates per acre of rock dust. In the

case of sandy soils apply up to 10 tons for the first application, thereafter up to 5 tons per year preferably in Autumn. For loam soils 6 tons, thereafter 4 tons split between Autumn and late Spring. For clay loam soils 3-4 tons, thereafter 3 applications of 1-1/2 to 2 tons in Autumn, Spring and mid-Summer. For rock dust with 50-60% smaller than 100 mesh, use approximately 2/3rds the above rates, and for rock dust 100% smaller than 100 mesh, use half the above rates. Coarse grades of rock dust can be used effectively as a mulch, or mixed into clay soils to improve the structure.

“In the case of bare soil, mulching is possibly the most important means of establishing an environment in the soil to maximize biological activity. It achieves this by reducing extreme variations of temperature and moisture in the soil. Wherever possible, apply the rock dust incorporated in compost, otherwise after applying the compost. However, as previously mentioned, this is not necessary when applying to soils that are already biologically active. Invest in the future, we can all make a difference by beginning to remineralize the planet soil where and whenever possible. To coin a phrase, we have nothing to lose and everything to gain”.



Campe family. The spiritual energy of the family and their love and care for the Earth and the plants around them clearly encourage plant health. ID's going up, Gaea, Joanna, Christian.

remineralization

begins at home

by Dan Hemenway

Those of us living on and as planet at this time are involved in a struggle to determine whether power or force shall claim the greater strength in choosing life or destruction for the material world in this material time.

Power arises from faith—faithfulness to the intrinsic and unique nature of each element of creation and faith in the one-ness somehow inherent in all this inherent diversity. Much is said about

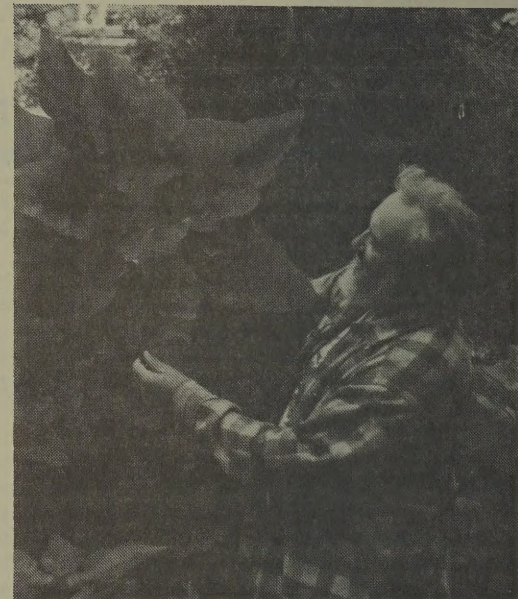
our one-ness. This article looks at acts of power stemming from our diversity, when our simple daily acts and decisions articulate our perceptions of the right relationships between ourselves and the Earth or the Universe, when we strive to live according to our best understanding of our responsibility.

Just two days prior to this writing, I conversed with Christian Campe about the simplicity and orderliness of the environments he creates for himself which he described as in contrast to his garden where wild trees have gained a foothold with the obvious purpose of displacing much of the intended and planted vegetation. Where Christian saw contrast I see unity. Wildness for me is the discipline to manifest one's intrinsic nature. Control arises from inner nature, not from imposed behavior. Christian, manifesting his orderly habitat carefully and thoroughly is as wild as the volunteer black walnuts in his garden simultaneously affirming their desire to reach toward full illumination from the sun with their stem and leaves and to penetrate the moisture and fertility of Earth with their roots. Each plant responds to the other plants nearby as to other physical, biological, chemical and spiritual influences it experiences, but always solely and entirely in ways true to its internal nature. Competition and cooperation, co-existence and suppression variously result. Over time cooperation becomes the primary expression of what becomes a biological community, which achieves synergistic efficiencies in transforming energy from Father Sun and fertility and moisture of Mother Earth into a libidinous affirmation of teeming life.

Our role in this, in my view, is derived from our particular natural ability to choose power or force. We can, in shamanistic fashion, through telepathy and science, read the intentions of Life for a place and assist in the affirmation and enhancement of those intentions. Or we can become, as we recently have chosen, to be the Bulldozer People, compelling a plodding death march on the beings that would naturally dance in increasingly enriched expressions of the cosmic music of Joy.

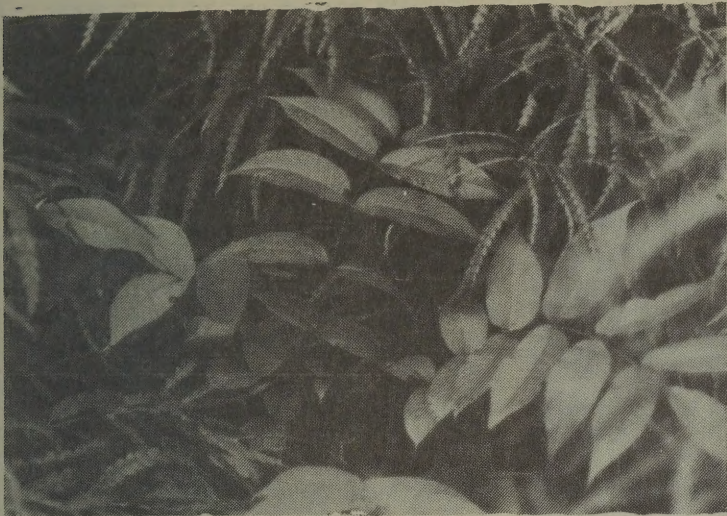
The brute force of our natures as the Bulldozer People seems on the surface an overwhelming strength, against which daily choices of Earth care—recycling a sheet of paper, conserving a toilet bowl of water, casting an unused crust of bread to the birds—seems petty and futile. But it is an illusory seeming only, in my experience, a dark beam flashed in our eyes to obscure the greater strength in the power to choose simple acts which bring us progressively closer to living the lifestyle we believe in and achieving the wild power of being ourselves.

It is in the context of such thinking that the following article explores the landscape planting around the home of Joanna, Christian and Gaea Campe. I am convinced that the vibrations from such small acts of Earth-healing will be amplified and resonated through the planetary consciousness and being. It is from small acts, such as how we landscape our homes, that our wildness takes form and our natures as participants of Earth sing. So we are choosing every moment in every act or restraint whether to be the Singing People or the Bulldozer people. In the scheme of unfoldings, the time for us to choose is now. The choice has not yet been made.



A tall Dan Hemenway showing off an even taller catalpa plant.

Soil health and resulting plant health, express complex interactions of simple—indeed elegant—principles. Earth articulates, through her ability to transform Sun's energy into the abun-



Black walnut emerging from a cover of sweet fern. Enhancement of black walnut growth by companion planting with nitrogen-fixing shrubs has been demonstrated, although I don't think sweet fern was tried.

dance and beauty of life, harmonies and synergies of soil, air, water, and minerals; spiritual influences; and the ability of Life herself to produce the conditions she needs through the actions of her various organisms.

The gardens at the home of Joanna and Christian Campe demonstrate how humans, with our special gifts for gathering and focusing energies, assist this transformation. While acid rain and related airborne pollution degrade and destroy plant life in most of Northampton, Massachusetts, USA, where the Campes live and indeed over much of the North Temperate Zone, their gardens sing in health. In 1983, the Campes made an initial landscape planting according to a design partially incorporating elements of edible landscape design. In 1985, Christian modified the planting to achieve more appropriate spacing between woody perennials and to develop a screen to dampen noise and pollution from traffic along busy South Street where the home is located. I assisted in the planting of some fairly large arbor vitae trees at this time. The final planting included numerous bay laurel and sweet fern, a number of dogwoods, an area of hemlocks, and assorted other landscape ornamentals, some with edible products.

All plantings were mulched generously with wood chips and then dressed with rock dust in the following year.

Apparently little maintenance for these trees and shrubs has been needed.

I write this piece on September 1 1989, after several days' opportunity to closely examine the beds while a house guest here at the Campe home.

On arriving for this visit, my immediate impression was surprise at the rate of growth and obvious vigor of the plantings since I assisted in their establishment four years ago. The Campe residence is virtually enclosed with a vibrating verdance. Vegetation has even closed off one of the side-walks leading to the house.

My second observation, almost immediate as well, was that heavy cover produced by dense and rapidly growing intentional plantings has not

at all suppressed the establishment of volunteer tree seedlings, primarily black walnut, sugar maple and catalpa, presumably with the agency of squirrels in the case of the nut and winged seed in the other cases. A scattering of other species—various oaks, silver maple, dogwood, apple, tulip tree, etc.—also have volunteered. Typical annual vertical growth for such volunteers is two to four feet following the year of establishment with nearly five feet of vertical growth in a few instances.

Comparisons

I have a long history of personal association and deep personal roots in the Hampshire County where Northampton is seated. Branches of my father's family were among initial European invaders and later settlers and the family names of Hemenway and Hawley were used in this region for streets and public buildings.

I have clear memories of visits to my grandmother in nearby Amherst when I was a boy. As a youth I attended the University of Massachusetts in that town for three years, including in my studies courses which enriched my naturalist bent. As a man I moved with my family to the town of Williamsburg, which adjoins Northampton, established a homestead, and became absorbed into the brook, woods and meadows of that place which is still inseparable from

my identity. I also homesteaded for several years in neighboring Franklin County, which shares the "Pioneer Valley" bioregion with Hampshire county.

I recount this history of my intimacy with this region to establish credibility as an observer of trends in the health of the natural environment here. As a boy I was ever in the forest, where the soft, moist forest floor almost seemed to me in a cushion of protection. My recollections of forest health are confirmed by my experience of isolated patches of healthy woodland over the past few years. By the time I entered college, I had established a successful landscape gardening business and was paid, in part, for my perception and understanding of plant health. More recently, I have been active internationally in the development and teaching of permaculture and in addressing and seeking solutions to global deforestation. I feel that the Earth has asked me to be one of her lovers who speaks for the forests of the planet.

Like most of the woody vegetation in the Northern Hemisphere, the health of trees, shrubs and forest ecosystems in this bioregion is declining



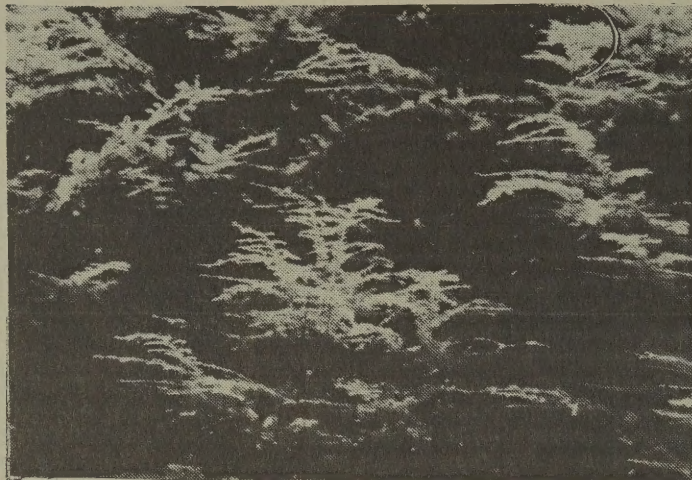
Not a very good composition, but a clear and easy-to-reproduce photograph of a very healthy sugar maple seedling. This is much healthier than the seedlings in the "healthy spot" down the street. It is difficult to compare otherwise because so few maple seedlings survive polluted soil, air and water.

rapidly, and forest ecosystems here are in the process of collapse. Few native species of trees which occupy mature forests can withstand the cumulative effects of environmental degradation, culminating, for them, in airborne pollution (acid rain complex) and record-breaking climatic extremes. Except where dying trees shed unusual amounts of fresh litter as twigs and bark, organic matter on the forest floor, the spongy duff which used to feel like a wet mattress, is now thin or non-existent. Walking in the forest becomes increasingly like walking on uneven pavement, with erosion and/or establishment of grasses (toxic to many trees) the inevitable result.

Trees die typically from the top down though some species in some circumstances decay from the inside out until their thin shells of life shatter. Tree leaf size is stunted. Growth is frequently deformed, heartrot is common even in young trees, crown density is very thin, and reproduction, particularly of mature forest ("climax") species mainly or entirely fails, even though trees produce heroic masses of cone, fruit and seed in vain attempts to reproduce before dying is complete. Forest species composition shifts toward the harder, though often scrubby, pioneer species, a process I call "reverse succession." Forest bird species, particularly songbirds, are vanishing and seed-eaters sometimes somewhat proliferate, an ecological indicator of a shift toward desert conditions. Disease and insects consume weakened trees in a futile effort of the ecosystem to make room for (non-existent) healthy individuals. Songbirds which control many insects are not replaced by other forms of insectivores as songbirds vanish from the planet.

An assortment of these symptoms are evident here along South Street in Northampton where it appears inevitable that most of the street and yard trees will finish dying within the next five years. However, this decline has been reversed in the Campes' yard, creating a strong contrast between the health of their plantings (and volunteer trees) and the dying neighborhood vegetation. Black walnut and sugar maple, which have a particularly difficult time reproducing under current conditions, are

among the more common species springing up in their beds. Even older yard trees seem to have made a partial recovery from "decline". Interestingly, there is one other oasis of health on South Street apparently entirely wild and untended. (see side bar)



This photo shows the health of the hemlocks which have been remineralized and mulched in the Campe's yard.

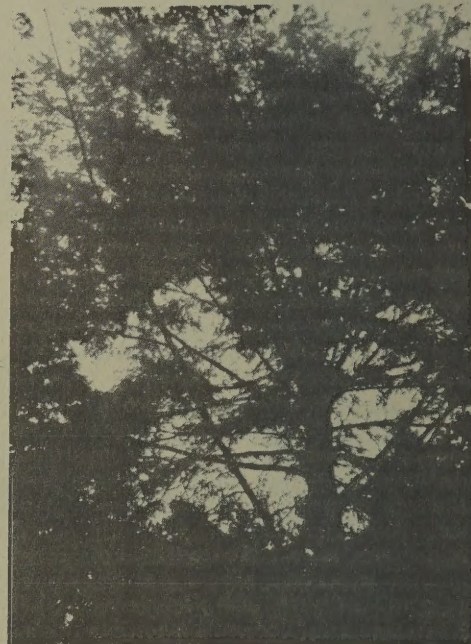
Speculative Analysis

The obvious implication of the difference in health between the Campes' yard and that of adjacent homes is that different conditions exist here. I suggest that four factors may be involved, interacting inextricably, as is Nature's way.

1. **Mulch** The rich mulch of wood chips around the Campe plantings unquestionably promotes fertility and good soil air and moisture balances. As proven by the French soil builder Jean Pain, wood chips are particularly effective in restoring depleted or damaged soils. Wood chip mulch stimulates high earth worm populations, providing aeration of soil and creating channels for breathing (gaseous exchange) and rapid penetration of rain. Of interest in soil remineralization efforts is the grinding action of small soil mineral particles in the worm's gizzard, which, combined with biochemical activity, releases fresh soil mineral in castings. (Castings probably enhance nitrogen fixing and may be inoculated in the worm's gut with beneficial microbes and fungi spores as well.) Some earthworm species deposit castings at the boundary between mulch and soil, creating rich conditions for feeder roots which concentrate in this region. The mulch-soil boundary also is charac-

teristically moist and of moderate temperature, beneficial conditions for optimum root function. Fungi feed on wood chips and release through "digestion" minerals "tied up" in soil. Many of these fungi form mycorrhizal associations with tree roots, feeding them directly with mineral and nitrogen nutrients in perhaps the same relationships as a gardener cultivating a crop of tomatoes. Non-mycorrhizal fungi also benefit trees through opportunistic relationships.

2. **Soil Remineralization** with stone flour appears to be an important contributor to the health of the Campe gardens. The benefits of stone flour are amply discussed on a regular basis in these pages. I would only point out that the beneficial action of fungi, earthworms and microbes in releasing nutrients from stone flour, as noted above, in effect makes the stone flour and mulch applications a single integrated system rather than two separate soil amendments. It seems obvious to me that increased availability of stone flour and native soil minerals will stimulate nitrogen fixing. I frequently apply wood ash, another source of trace minerals, to stimulate crop legumes to prodigious levels of nodulation (resulting in high



A typical hemlock in nearby Williamsburg, MA, taken on land to which I have held legal title since 1968. It is from a slide I shot to compare with a slide of the same tree taken in 1972. In '72, you couldn't see 3 inches into this tree for the density of the needles. I think that this contrast justifies trials on a fairly large scale to determine the effectiveness of remineralization in helping trees resist the destructive poisoning of pollution.

rates of nitrogen fixing), and I routinely substitute stone flour when wood ash is unavailable. (However, I have not not run controlled experiments as would a scientist. My goal, rather, is to make best use of materials at hand.)

3. **Species Selection** here has an obvious beneficial effect. Many of the species planted tolerate poor soil conditions. For example, sweet fern (a nitrogen fixing shrub), bay laurel, and arbor vitae all grow in sandy, relatively barren conditions naturally. The sandy-silt loam left by the gyrations of the Connecticut River across this region probably suits their need for drainage and they doubtless enjoy enhanced soil fertility and some protection from competition provided by the mulch. Such pioneer species prepare the soil and near-ground microclimate for the forest which are indeed growing up through their ranks. Other species planted here which serve as pioneers or occupy difficult habitats include rhododendron, Canadian hemlock, various dogwood species, blueberries, and June berry. I've probably skipped a few. The establishment of plantings with a pioneer eco-role was quite fortuitous and is precisely the best choice for utilizing the mulch and stone flour to prepare for establishment of the very tree species which indeed have seeded into the beds. A few of the pioneer shrubs have died from causes which are not obvious; however, the establishment of longer lived trees through them is already complete. The strong growth of nitrogen fixers such as sweet fern (planted) and black locust (volunteered) unquestionably stimulates health of the plantings overall and provides particular benefits to heavy feeders such as black walnut volunteers.

Spiritual Energy can greatly benefit plants in adverse circumstances, in my observation. I have noticed that around spiritual people, tree health is sometimes vigorous even though surrounding nearby trees are dying. This effect can be sufficient to account for the health of the Campes' plantings entirely, though my opinion is that it interacts with the material and biological forces mentioned above to create the health observed.

Scientific research could seek to isolate each of these factors to measure any influence, factor by factor, on measurements accepted as tokens of plant health. There is a role for such research in developing strategies and recipes for remineralization with stone flour from various sources in differing climates, soils and species mixes. However, there are absolute limits to the usefulness of taking apart

Humility on South Street

In preparing to write this article, I paid special attention as I walked around the neighborhood to the health/sickness condition of woody vegetation. I was delighted and astonished to find a patch of vegetation every bit as healthy as the Campes' but completely wild, growing in "vacant" land almost into the center of Northampton.

Characteristics of health included leaf size of Norway maples far larger than the span of my hand and sugar maple leaves almost as large. A very large wild black cherry impressed me because I have not observed a large, healthy specimen of this species in New England in at least 5 years. Entering the wooded area I found that it was littered with trash of all descriptions from a defunct rail hand-car to soda bottles and had been used as a dump for surplus cement when an adjacent parking lot was carved from it. A large woodchuck den showed me, through the spoils, that the "soil" is coal cinders which had been dumped as fill and/or disposal on the flood plain of the Mill river, after it was redirected by the city fathers. Since a massive sugar maple is growing out of the cinders, they must have been deposited at least 100 years ago. This is probably the largest sugar maple I have ever seen in my life. The crown of the maple shows signs of deterioration no doubt due in part to old age and in part to pollution. Surrounding the maple is a grove of giant black locusts.

The woodland floor is mostly bare, exposing soil, with no duff. Some sugar maples have managed to sprout and become seedlings, but the stand to be expected under the feathery canopy of the

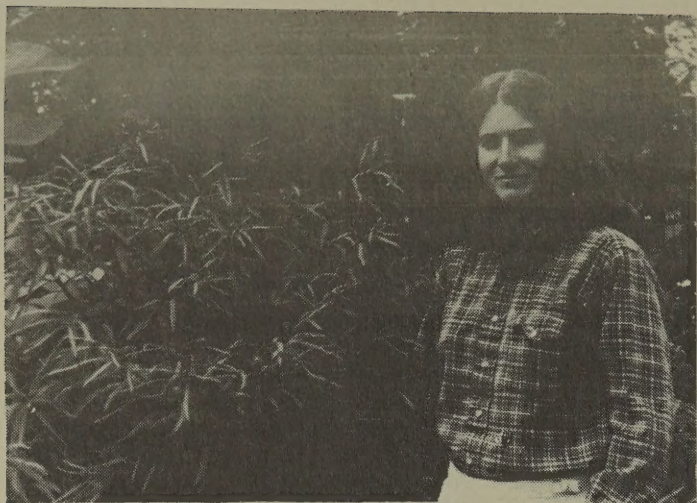
locusts hasn't developed. Nevertheless, the vitality and magnificence of this scene impressed me as no forest has since my boyhood.

I have no explanation for the health of this patch of wood, only a few hundred feet from terrible scenes of dying and decay of street and yard trees. Maybe the minerals in the coal cinders are very beneficial to the trees, although often coal ash contains severely toxic levels of heavy metals. Possibly the spirit who shares identity with the giant maple has kept this acre invigorated with pure spiritual pizzazz. Or maybe, some ceremony or land use of a past resident of particular spiritual strength imbued this little territory with resistance to evil, including our toxic byproducts. Maybe a great Nontuck shaman is buried beneath the giant maple tree. I can speculate but I really do not know the reason for this spot of health, however useful that information might be in saving forests around the globe. But not knowing also has its use. While we observe, speculate, hypothesize and research reasons why nature performs as she does, clearly we gather only the scantiest understanding of her processes and those must be regarded as strictly tentative. This patch of woodland health on South Street is a lesson for me in humility. While we see forces at play and think we begin to understand their interactions and consequences, nature has more in reserve than we can ever anticipate. As Fukuoka tells us, Nature is all knowledge and we know nothing. That is exactly why we should seek to understand her instructions and never seek to modify or improve upon them.

living systems to see how they work or what works best. Given someone working solely from scientific approaches or the non-scientist who is intuitive and attuned to the earth, I do not doubt that the intuitive non-scientist will accomplish more for the Earth every time. Fortunately, we do not need to make choices between such abilities for, like mulch and stone flour, they can be different aspects of the same process. (The real choice before us is to choose power based on our inner and material resources. The simplest act to heal the Earth, such as mulching bushes around one's home, may seem trivial because it is so easy compared with halting industrial pollution or saving the tropical rainforests. However, it is easy because we are powerful in choosing our own paths for healing. It

is through such simple choices that we may save the planet from final desecration and our species from extinction in the immediate future.

Dan Hemenway is editor and publisher of Robin, newsletter of the Forest Ecosystem Rescue Network (FERN) and of The International Permaculture Species Yearbook (TIPSY). He is available to deliver lectures and lead workshops for groups interested in forest rescue concerns as well as in permaculture. He may be reached at P.O. Box 16683, Wichita, KS 67216 USA.



The Rock Dusters of Clesson Brook

creating a commonwealth of health

by Caroline Wurtz

Caroline Wurtz next to a very large remineralized sweet fern from the garden of Joanna Campe.

I opened the Clesson Brook Wellness Center in May of 1989 as a center for people to come and achieve and maintain wellness. We as beings have different needs and some are nurtured by the foods we eat, and some needs by the air we breathe. Our bodies are made up of the elements of the earth. It is important that we respect the earth. If we pollute the earth, we can't escape—we have to live with the results. When we are in harmony with our bodies and environment there is wellness. I do acupuncture, counsel with whole foods and I distribute rock dust. My efforts are to create a commonwealth of health, which means that we all have a right to health, strength and vitality. All my efforts are so that people might have these things.

I first heard of "remineralization" in those words from the Uprichards family. We know each other as part of the macrobiotic community. Steven Uprichard gave me the film **Stopping the Coming Ice Age**. I then invited people to my home to watch the video. I worked as an apprentice at the South River Miso Farm. The Land is protected from pesticides and herbicides and they use natural farming. I was impressed by the plants there, especially their strength, health and resistance and other than birds eating the corn—they weren't devoured.

It made such an impression on me that in the total absence of chemicals and fertilizers these were the strongest and healthiest plants I'd seen. When I finished my apprenticeship I felt very strong within me that strong gardens could grow without these things and I wanted other people to know chemicals were not necessary. I saw they were used out of fear: Fear crops would be destroyed or they'd have less yield otherwise. And if people knew they didn't need them they'd quit using them.

I wanted to obtain land to do organic farming—but it didn't settle right and seemed to be more in the future. The Uprichards wanted to use my pick up

truck to pick up dust and we went to a source and as a geologist I didn't think it was what they wanted. It was coarse trap rock. I thought they must want something with a greater surface area per mass of rock and Tamra wanted powder. We went to the Amherst source on Route 116 and it seemed to be exactly what she wanted.

After I showed the video—others wanted rock dust and I delivered it for them. They've all been in the macrobiotic community so far.

I delivered rock dust to the South River Miso Farm to see what effect it has on such a healthy farm.

I studied geology at Boise State University for four years. When I finished the program there I felt I had a lot of information that felt like it was all there for a reason and yet my real motivations in life were from a completely different source. I was motivated out of compassion and I wanted very much health for all. The rock dust seemed to bridge the

gap between my mineral world and desire to nurture. The rock dust nurtures the earth which is our mother and common to all of us. By nurturing the earth, the earth gives us food from which we are nourished. If we keep our earth clean, then she'll be clean for us. The thought I have now is that any toxic materials we create, we can't escape the effects. The bottom line is we just have to stop making them. The earth naturally provides. It makes sense scientifically and from the heart rock dust feels appropriate. I have a strong sense of conscience. Rock dust doesn't violate the conscience. I am very careful what I use around my home.

As far as the climate is concerned, theories come and theories go—but the earth shall always be. There is a part of us that is all connected. Personally, I'm not motivated by the fear of an ice age. I would hope that the dynamics of change would be governed by compassion rather than greed.

Basalt Rock Dust

Volcanic ash has been known for its nutritive value to crops, for ages. Fertile lands at the bases of volcanoes have a strong attraction for colonization. In Western Massachusetts there is a source of basalt rock dust that has many of the qualities of volcanic ash. The fine grain size makes available a large surface area per mass of rock, so that natural chemical weathering in the soil makes accessible the elements for the plants.

Basalt rock is high in iron and magnesium, two very important elements in the building of strong blood for vitality, and maintaining a strong and healthy skeletal structure and nervous system. Grains, legumes, and vegetables are natural sources of iron and magnesium for nourishing our bodies. Iron is necessary for hemoglobin and myoglobin formation. Iron helps in protein metabolism, and promotes growth. Iron deficiency symptoms are weakness, paleness of skin, constipation, and anemia. Magnesium acts as a catalyst in the utilization of carbohydrates, fats, protein, calcium, phosphorus, and possibly potassium. Magnesium deficiency symptoms are nervousness, muscular excitability, and tremors. The conditions of many people, on a continent with an abundance of food, reflect deficient nourishment.

Why deficient nourishment in an abundance of food? Poor forms of food processing can devalue the quality of food. However, if the elements are not available in the soil, the plants can not mature to their full potential. Beware, chemical fertilizers can leach into groundwater systems and run off into surface waters, and cause unnecessary side effects. Rock dust has a natural balance, it has not been concentrated or extracted. Rock dust is natural and safe.

Basalt rock dust is sold in quantities small and large—5lbs. to dump truck deliveries. For information, recommended quantity, delivery, and application order at:

Rock Dusters of Clesson Brook Wellness Center
P.O. Box 55 Shelburne Falls, MA 01370
Tel. (413) 625-9990

Remineralization with Marl and Dolomitic Clay

by Eckhart Stoyke

The REAP Society (Restorative Ecological Agriculture Project) was founded in 1988 to test, among others, the ideas provided by the *Soil Remineralization Newsletter*.

In the absence of funds, readily available materials for remineralization were chosen. Marl, a calcium-magnesium compound found in old fresh water lake bottoms, is mined as a base material for cement manufacture. The "dolomitic clay", a marl-like material, was found 5 feet below ground level on a hillside sloping down to Big Lake near Edmonton, Alberta, Canada. Big Lake is known to contain a major marl deposit.

An analysis of the materials in parts per million* by water media extract gave the following values:

Contrary to what one might expect, Portland cement may be made from materials as diverse as limestone, shells, chalk, marl, shale, clay, and slate. The results obtained with these materials as remineralization agents therefore can vary significantly and will not benefit all soils or crops as shown in the REAP test.

The yield diagrams cannot be analyzed without taking into account the ta-

ble of plant feeding (composting) level. Sixty test plots of 6 treatments times ten replicates of 25 m² each were prepared. Treatment #5 had been earmarked for chemical fertilizer but received no treatment due to late arrival of the soil analysis. Each plot was seeded to 10 different vegetables.

The pH of the soil before treatment was already 7.5. Yield improvements through addition of marl or clay therefore were due to factors other than the further increase of the pH value. The addition of dolomitic clay without compost was shown to be detrimental in all cases, probably because it reduced the available air space in the soil due to its low particle size.

Trace mineral analysis of the soil before treatment showed the following values that were mostly higher than those of the mineralization compounds:

Boron	1.24	ppm
Zinc	3.42	ppm
Copper	1.30	ppm
Manganese	75.00	ppm
Iron	135.00	ppm

The composted plots received the equivalent of 10 tons of compost per acre, and 2.8 tons of marl and clay per acre.

Besides dill and cabbage, potatoes showed a 25% yield increase with compost plus marl over compost alone. There was no shortage of rain during summer so that the compost did not have to act as a moisture buffer and therefore did not distort the preference of the various vegetables for its presence.

The biodynamic feeder level chart was very accurate for onions that show yield losses with compost whereas dill did not confirm the chart. It should be mentioned, however, that the dill developed unbelievably thick stems whereas the leaves did not show a proportionate increase.

The results must be considered preliminary and should be repeated in acidic soils, preferably with the addition of a proper rock dust.

	Marl	"Dolomitic" Clay	Desirable Range (ppm)
pH	7.8	7.8	5.5 - 6.9
Nitrate	256	28 lbs/acre	35 - 180.
Chloride	23	—	0 - 30
Sulfates	688	33	30 - 60
Phosphorus	1	32 lbs/acre	5 - 50
Potassium	15	156 lbs/acre	35 - 300
Sodium	82	74 lbs/acre	0 - 30
Calcium	860	7352 lbs/acre	60 - 400
Magnesium	424	1046 lbs/acre	30 - 200
Zinc	0.01	1.2	0.3 - 3.0
Copper	0.03	2.9	0.001 - 0.5
Iron	0.19	120	0.3 - 5.0
Manganese	0.01	75	0.02 - 3.0
Boron	—	0.55	0.05 - 0.5

*) unless shown otherwise

SR Research Packet

SR offers a Research Packet it has made available in the last year on remineralization research around the world including Germany, Austria, and Australia for forests, agriculture and orchards. It will soon be updated with two new studies.

Send \$7.00 within the U.S. and Canada and \$10.00 outside North America to: SR Newsletter, 152 South Street, Northampton, MA 01060.

NEPA AND THE NEXT AMERICA:

Designing our Transition to Global Sustainability

by Andrew Euston

The following is part of a keynote address by Andrew Euston, FAIA, Sr. Urban Design and Energy Program Officer, U.S. Dept. of HUD delivered before the "NEPA 20th year" conference of the President's Council on Environmental Quality concerning "The National Environmental Policy Act: Today's Law for the Future", September 21-22, 1989, Washington, D.C.

I will be sharing here a NEPA-based perspective for the shaping of a positive outcome, but let's look first at some troublesome things in our way. The title I chose for this talk is "NEPA and the Next America: Designing Our Transition to Global Sustainability". It has implications we have yet to cover. I continue first by portraying that from which we must transition—our troublesome current reality. For Americans it is a double-pronged global threat of economic competition and of environmental decline.

As a part of my work I have structured with a colleague six national HUD-DOE Community Energy Systems annual conferences aimed at local energy-efficient investment partnership. Last February's event focused upon "Energy Competitiveness and the Environment", for which dozens of scientists and experts were canvassed. I came away from that experience alarmed for my seven year old and more so for his successors. Current reality for humanity is grim. Hope lies in collective actions taken to transmute the prevailing baneful conditions of world ecology, hunger, justice and governance. Taking ecology alone, this nation's role is compromised by a range of bad habits such as:

- utter dependency upon cheap, carbonaceous fuel;
- the proclivity of corporate enterprise to engage in pre-emptive maneuvers that ward off potential competition to it which would otherwise benefit our politically under-represented global ecology and; a prevailing popular disconnection in this, our seventy-five percent urban/suburban-dwelling society, from local governance of our resource consumption patterns and their global ecological consequences.

This latter trait is perhaps the more grave. We all take part. It amounts to mass denial. As a result this dysfunctional behavior perpetuates

"We need to seek ways in which the provisions of NEPA can remineralize the pioneering soils of eco-creativity in our country. Although our endeavors may yet beg a Constitutional amendment, or better still a global ecological treaty, NEPA stands firm as America's formal constitution with the sacred systems of the earth".

inefficiency and inaction in the face of declining competitiveness and a declining global ecological base of life support. Our lack of corrective focus and intent may yet bring this urban industrial civilization down. Some conclude we have effectively done so already. Consider the fact that civilization is already determining:

- what creatures go extinct
- how long growing seasons shall be;
- how healthy food is to be;
- if there is food to feed the world;
- how much skin cancer people get;
- how many genetic booby-traps get planted;
- the waters fishable, water potable, soil tillable;
- how much phytoplankton is at sea;
- how much oxygen we have to breathe.

Hopefully we are reaching a critical mass of news and scientific information with which to overcome the collective stupor. Our science base is critical for a mobilizing of public concern and political action. Yet getting to consensus on warming at the equator has seemed to be taking too long. In fact, some biological sciences have support for the view that warming is the advent of the next 90-100,000 year ice age that is due, give or take many centuries, along about now.

If at all possible, we must rapidly get beyond theory and into an effective predictive stance. It is central to humanity's strategic defense—a defense in point of fact against ourselves. Climatic symptoms acting upon the U.S. alone already indicate radical reductions are in plain sight for our arable resource base, further menacing trade balances and world stability, should the U.S. trend from food exporter to food importer maintain and accelerate.

One thing I have discovered for myself is how very diffident the sciences can be around the surfacing of environmental news—good or bad. Another is how crucial has become the encouragement of a transdisciplinary scientific spirit. Today, sustaining of civilization hinges fatefully upon a rapid decoding

of the combined ozone-layer/global-warming/pre-ice age signals of atmosphere, geology, oceanic and biological life. Yet climatologists have exhibited their disdain towards, say biologists until too recently. In any event, we may look forward to hearing tomorrow from the prominent scientists and others whose findings may further calm or ruffle our minds on many such points.

I see ours as yet again a nation of pioneers or rather of pioneering communities. Those of us here today are potentially a community of pathfinders. Pioneering or pathfinding, we Americans are already embarked on a roadway of transition having NEPA at its head. However absent the fearful possibility of some eco-holocaust—an ecological Pearl Harbor of some sort to stir us into action—we Americans have only our deliberate intent with which to mobilize the transition from where we are ecologically to where we should, for the sake of the human family, prefer to be. Prefer it or not, ours is a global transition from the environmental era of the present to an emerging ecological epoch.

The Sustainable Enterprise Marketplace

My talk now brings us back to NEPA by presenting the concept of the Sustainable Enterprise Marketplace. I believe it offers us a uniquely positive means by which to mobilize public support behind creating a transition to global ecological balance and sustainability. Sustainable Enterprise derives from my own experiences at HUD in working with NEPA. With this presentation, therefore, I offer six basic principles for a strategic environmental policy designed to reinforce our nation's likely destiny as humanity's principal determinant in shaping the fate of our planet's vital systems of ecology—likely, that is, if we choose to grasp the opportunities before us.

Concerning the creative work we have ahead, principle number one is that **governmental agencies at all levels which have to do in some significant way with construction, buildings, production or resources must become creative activists in**

support of the nation's strategic environmental objectives. HUD offers us an example of this environmentalism, one demonstrating the potential for relating a domestic agency mission directly to these global concerns.

The Department of Housing and Urban Development has begun to explore the potential for encouraging communities to enter a burgeoning, international, ecologically-responsive marketplace which we at HUD have labeled as the Sustainable Enterprise Marketplace. The dynamics of this fast evolving marketplace are characterized by the need for drawing, so to say, upon the earth's ecological interest rather than using up its ecological principal, whereby the global resource-base necessary to sustain life becomes harvested and replenished rather than spoiled, trashed or lost.

Principle number two which underscores the future virility of this Sustainable Enterprise Marketplace was presented this January in *Time* magazine's unprecedented "Endangered Earth" issue. Civilization is "at a critical turning point: the actions of those living will determine the future, and possibly the very survival of the species...We must do a thousand things differently".

It is this marketplace which is examined in twelve in-depth articles of a special September issue of *Scientific American* on "Managing Planet Earth". Four articles specifically cover entrepreneurial strategies: "Strategies for Agriculture", "...for Energy use", "...for Manufacturing", and "for Sustainable Economic Development". The issue's anchor article, entitled "Toward a Sustainable World" and authored by former EPA Administrator William D. Ruckelshaus, explores principle number three for the work ahead in environmental quality, namely that people and nations are being faced by the global ecological crisis with a values shift which is to be compared historically to the transformative impacts of both the agricultural and the industrial revolutions.

It is this marketplace whose commerce was found to be coterminous with the world's most viable national economies in a study performed six years ago which lead to the United Nations' authoritative Brundtland Commission Report, released last year with its urgent warnings that industrial civilization mend its ways.

It is this marketplace that has established itself here in the U.S. over the past decade of energy cost fluctuations, agricultural difficulties, toxic waste revelations and of intensifying public concerns about healthy foods, potable water or recycling as well as focus on the great promise of district heating and cooling, bio-mass municipal waste wa-

ter treatment systems, rock dust soil remineralization, local import replacements and value-added agroforestry strategies.

It is this marketplace which the Japanese lead in photovoltaics, Canada leads in pursuit of hydrogen as a fuel, Russia leads in the use of district heating, Scandinavia leads in the techniques for thermal storage or Switzerland leads in optimal public transportation. We can take our place along side of these precursors, if our local communities come to see the wisdom of it. We have the inventors, but our urban civilization will have to pa-

"I see ours as yet again a nation of pioneers or rather of pioneering communities...However absent the fearful possibility of some eco-holocaust-an ecological Pearl Harbor or some sort to stir us into action- we Americans have only our deliberate intent with which to mobilize the transition from where we are ecologically to where we should, for the sake of the human family, prefer to be".

tronize them better than we do. Foreign investors are ahead of Americans in securing U.S. patents. Since 1986 we have had trade deficits in high technology. These points bring me to principle number four that our communities equal the demand side of our ecological equation, and it is there where we must achieve sustainability-better as foresight than in crisis or cataclysm.

Since the ecological lessons of 1988 little doubt should remain with this audience that civilization is immersed within an ecological crisis and is at dire risk of suffocating and burying itself by its proudest handi-works. Each American community must begin somewhere to help save the environment, if this dire objective is to be pursued in time to count. Principle number five, our local communities directly control upwards of forty percent of the nation's energy and resource consumption choices. This calls for concerted local sustainable entrepreneurship that combines energy, environmental, commercial, industrial and agricultural know-how and innovation.

If America's path-making entrepreneurship is to be sustained competitively within this new Sustainable Enterprise Marketplace, our communities will have to mobilize their own local transitions to make this happen. Directly tied to NEPA in some important ways, and adding one final premise for shaping our strategic number six is this: to become sustainable themselves our communities will have to internalize the globally-scaled Sustainable Enterprise Marketplace. For one thing, the dynamic choice-making institutional infrastructure of our local public, profit and non-profit sectors must readjust itself anew.

Clearly, such complex shifts as these must come out of locally perceived need. As I shall touch upon, they can be made in the positive, creative spirit which the word "enterprise" implies.

Where the intent is present, people can begin by building upon the local community and economic development foundations already put into place over the past two decades-foundations influenced in large part by NEPA and its environmental design mandate-foundations which have entailed active public involvement in such urban environmental design quality-of-life matters as historic preservation, balanced trans-

portation, multiple-use and joint development, fair and decent housing, safe and amenable public spaces and ancillary concerns about civic pride, cultural celebration and diversity.

The six eco-environmental principles put before you have local business enterprise as the focus rather than, say, NEPA as our handy Federal tourniquet for the ratcheting of remedial eco-environmental surgery. My two decades with HUD as the person assigned to urban design has offered me a unique purview of how an urban civilization operates when it urbanizes. As a direct consequence of this exposure my emphasis is with the softer creative administrative potentialities of NEPA as opposed to its harder police powers. Relevant to a positive and creative use of the Act there is both a metaphor and a solid institutional NEPA-supported community development bridgework to be found in our communities. Understanding this local-level picture may be helpful in positioning this Federal-level enactment to help solve the global ecological crisis.

As I have proposed it, the Sustainable Enterprise Marketplace is a means for entering the culture through the front door, through commerce, through jobs. If the wary public is to accept its situation ecologically, it is going to need an alternative to more restrictions. It is not enough to come down on water treatment compliance, if construction grants are gone. It is not enough to say conserve, if it's not the local crisis of the moment. Communities are becoming environmentally awakened, however, and there are people in them for whom alternative ways to respond would become a desirable avocation or a vocation, if the option were put before them realistically. Local staging of such options could be greatly advanced by a coherent and or-

"As I have proposed it, the Sustainable Enterprise Marketplace is a means for entering the culture through the front door, through commerce, through jobs. If the wary public is to accept its situation ecologically, it is going to need an alternative to more restrictions".

chestrated Federal effort to set the stage nationally.

This then is what the bad global ecological news, the troublesome news is creating—a need for crafting and conveying to America's local common experience the growth and changes of urbanization as the direct consequence of everybody's incremental choices and decisions. This was widely so as Americans gawked while the bull-dozer converted a treasury of earlier urban fabric into parking lots. For most people the great blind spot today is with environment. Yet even for those concerned about it somehow the connection to the role of communities is not yet being made.

The main point here is that at the level of local community action we do have the people who can tie together tangible, physical places and things with abstractions such as design quality, environmental quality, conservation, appropriate technology and even the sustaining of life. America has this widespread, experienced, ecologically-sensitized local decision-making infrastructure out there and in place. In effect well sized and well designed human bridges are already in place locally for carrying a new-type NEPA pay-load. There are urban environmentalists to work with, to defer to, to enlist.

The eco-environmental job ahead is not just, if at all, about lawyers and clerks who must pound out more and better impact statements. It is mainly about shaping a positive climate and positive visions for creative local level solutions by ordinary, competent, community-oriented people. America has only begun the transition towards sustainability. Our cities and towns are the places to begin in earnest. Here is the deal: the genuine environmentalists in this society are equally urban environmentalists; the larger interdisciplinary urban environmental design field has never been broken; it does not need to be fixed; nor does it need to be reinvented; all it needs to be is enlisted and mobilized, and that is just about all.

There are those who say that America's greatest contribution to the family of nations is the movement towards people owning the power. One cannot but marvel at the likelihood of this exultant possibility in light of China's paper-maché evocation of France's gift to American freedoms, the Statue of Liberty. Others say that globally civilization is moving from reliance upon the authority to a reliance upon the group. Psychologist Sam Keen, author of *The Face of the Enemy*, which documents how easily in this century distortions

manufactured by the state have induced rage and violence towards the innocent, speaks of ours as already a "corporate society"—a conflicted one in need of new meanings, new ethical disciplines and new distinctions about one's obligations beyond oneself.

Who can say with certainty what societal patterns are to prevail? Human adaptability may not have strict limits, but nature certainly has them, as our "teflon" technocracy now finds. Earth is to be our school house once again. I myself sense that, for most of their inhabitants, the "corporate limits" of a metropolis of two or three million, as is Washington, D.C., already exceed the carrying capacities and liveability of nature. Yet several dozen cities are apt to exceed ten million during this next century.

That a multiple crisis of change is now being imposed immutably upon civilization by global ecological reality, this we understand. Now we may also choose to understand NEPA's first two decades of maturation as a prelude for what must come in terms of the intuiting and the internalizing of our nation's vital eco-environmental priorities and values. We have set some ground rules for governing the next America. These two complex decades of public, profit and non-profit sector environmental innovation and accommodation we may very properly compare to the Constitutional Decade, when it was that the nation's democratic ground rules were formulated.

What we are met to consider here is the nature of the transitions which are needed, if America is to act sanely towards humanity and the earth. We need to seek ways in which the provisions of NEPA can remineralize the pioneering soils of eco-creativity in our country. Although our endeavors may yet beg a Constitutional amendment, or better still a global ecological treaty, NEPA stands firm as America's formal constitution with the sacred systems of the earth.

The window of sanity may have been pried open for NEPA at the last possible moment for the sustaining of future human environments of any meaningful degree of quality. The past two environmentally-daunted decades are but a dress rehearsal for scores of ecologically critical decades to come. Their dire context is well established by science already—the context of global ecological survival for humanity. Urban industrial civilization is embarking upon a roadway leading from this present environmental plateau of national consciousness to the next plane

of understanding, that of global ecological consciousness. A window of dire opportunity for global ecological sanity has been opened. With the resurrection to prominence of the mission of the President's Council on Environmental Quality, our meeting takes on an importance which, I say, goes beyond any others to have taken place in this city heretofore.

Ours is the nation best poised to set a stage at this moment in human evolution either for continued and fatal global ecological destruction and decline or for the imperative of a deliberate transition to a global ecological balance. It is the balance which must be attained between an irreversibly industrialized and urbanized humanity and its essential natural ecological systems of life support. If the window of ecological sanity is to be held open for future generations, all of us in this room have a role to play in the outcome.

Given the scientifically supported ecological facts of life, it is during the next two decades that a hopeful course of global ecological sustainability must be charted.

Given the natural resource additions of urban industrial civilization and given the likely prospects now for a rapidly industrializing and over populated Third World, the utmost ingenuity must be applied to the creation of solutions.

Given the ecological consequences of the coming decades, it shall be global ecological balance, along of course with global disarmament, by which history shall be judging this nation and most particularly those of us in this room whose job is about ecology.

Given many specific creative attributes of our American society, it is our nation's move.

A new epoch is upon us now to be characterized by humanity's issues of global ecological sustainability. These issues will dominate humanity's choices for centuries. Where expansion and combat characterized the first two centuries of our U.S. Constitution's application, the sustainability of life will dominate the Next America.

Readers interested in learning more may contact the author at H.U.D. Rm 7156, Wash. D.C. 20410, (202) 755 5504. Current activity on this subject has taken the form of S.U.R.E., The Sustainable Urban-Rural Enterprise Project. HUD, Richmond, Indiana and Ball State University conducted a national conference in October and additional materials are available

Greens and the Greenhouse Effect

Evolving Green Platform USA

Because it threatens our continuing ability to grow food, the Greenhouse Effect may be the most urgent and ominous of all environmental crises we face. This urgency, along with all the other Green issues and themes it interrelates, makes confronting the Greenhouse a powerful organizing tool. Survival is highly motivating and may help us in building a mass movement that will lead to large scale political and societal change in a very short time.

First of all we need to inform the public that the crisis is more immediate and severe than we are being told. Its implications are too great to wait for the universal scientific confirmation that only eco-catastrophe would establish.

It is not just that we lost a third of all our grains in 1988, that droughts are accelerating, and that the effects of extreme excess CO₂ and other Greenhouse gasses in our atmosphere are increasing exponentially. By looking only at global temperature averages, most scientists are obscuring the more extreme climate changes that have been occurring.

Looking at temperature changes by latitude, zone, and season, it is clear that winters and high latitude regions have been getting colder for half a century, while summers and the tropics have been getting hotter and drier. There is strong evidence, for example, that the long 17-year drought in the Sahel region of Northern Africa was caused by Greenhouse Effect, and that it is this drought that is now spreading into the temperate regions and severely diminishing our ability to grow food.

The world now has only a 54-day reserve of food. If drought and colder winters continue to increase, our reserves could be used up possibly even before the end of the next decade. Third World and poorer peoples would be the first to starve, but the richest will not be far behind. We are in a global emergency of unprecedented magnitude, and it demands an immediate and global response.

What can be done?

1) Trees are nature's primary store of carbon dioxide, the major Greenhouse gas. The cutting of virgin forests must end immediately, so that their carbon is no longer released into the atmosphere.

To compensate for trees already cut, we must plant billions of acres of new, fast-growing trees of mixed species appropriate for different bioregions.

This is the only way the Greenhouse can actually be **reduced** (rather than merely slowed in its rise) because the new trees will consume carbon dioxide and store it in their tissue and in the ground.

2) **Remineralize** new and existing forests with finely-ground mixed gravel. This will increase their growth rate by 300-400%, according to experimental studies. Thus they will consume much greater quantities of carbon dioxide and help move us back from the brink and give us time to create a less polluting way to live. It is well known that temperate region soils become demineralized during interglacial periods and that they are remineralized during the ice ages as glaciers grind up a wide spectrum of types of rock into fine dust.

3) **Remineralize** all farmlands and orchards with gravel dust. Crop yields are increased 300% and more on remineralized soil, and the plants are so well-nurtured and hardy that they resist most insects and fungi on their own. All chemical fertilizers and pesticides can thus be immediately replaced and a new era of organic agriculture ushered in. Food grown on remineralized soil contains many more nutrients, and yields are much greater. This enables us to greatly increase our reserves of grains and legumes at this critical time.

4) All sensible energy strategies involve conserving energy in our homes, offices, industry, food production, transportation systems, and the like. This is especially essential in treating the Greenhouse Effect because of feedback loops in the climate system (for example, drought kills forests which increases released CO₂ into the atmosphere, which increases the Greenhouse Effect, which leads to more drought). We may be close to a point of irreversibility, when nothing we can do will be enough to stop the inexorable continued degradation of the climate and biosphere.

It is not possible at this time to determine how close we are to such a point. But any energy-intensive projects must be examined in this light. The energy value of a new, alternative, sustainable energy device can be estimated by comparing the amount of fossil fuel energy required to build it with its energy output during subsequent years. Simple passive solar devices such as attached greenhouses, double-glazed windows, and heat-retaining inner walls should probably be given priority now.

5) Where fossil fuels must be used, use primarily cleaner fuels such as natural gas and avoid the dirtiest fuels such as coal and heating oil (this includes so-called "clean" coal).

If we can reduce fossil fuel burning substantially for a few years, stop cutting down virgin trees and quickly plant vast quantities of new, fast-growing ones, and remineralize forests and farmlands, we may be able to reduce the Greenhouse Effect enough within four or five years that we can start using some of the new biomass (trees) to produce methanol and methane gas to begin to replace gasoline, natural gas, and heating oil. Sufficient surpluses of corn and other high-sugar crops grown on remineralized soil can also be used to make ethanol fuel. **By replanting these fuel crops, we will simply recycle the carbon into and out of the atmosphere, thus creating a nonpolluting, regenerative energy system.**

6) The Greenhouse Effect does not rationalize present nuclear power nor the creation of new nuclear plants. Nuclear power's problems are many and are discussed...[elsewhere]. But it is germane here to discuss why nuclear is not an answer to the Greenhouse.

The electricity produced by nuclear power plants cannot replace fossil fuels for most energy requirements. According to the Rocky Mountain Institute, for nuclear power to supply half our energy needs by 2025, we would have to build a new 1000 megawatt nuclear plant every 1.6 days for the next 37 years, which is not physically but financially impossible. Because an expansion of oil and natural gas would be necessary to supply the remaining half of our energy needs, emissions would still increase to a value 65% greater than they are today. The nuclear "option" is no option, not even a partial one.

For information on joining a green group in your area write to:

**Green Committees
of Correspondence
P.O. Box 30208
Kansas City, MO 64112**

This excerpt is taken from:

**Green Letter
P.O. Box 14141
San Francisco, CA 94114**

Green Letter is an independent educational forum devoted to reporting on activities of the Green Movement. Contributions to receive the newsletter are suggested at \$20 a year and up.

Down Under

Research of Keith Gray continues with good results in Rotorua, New Zealand

In the 1988 Fall issue of *SR* # 11-12, (page 16-17) you printed a copy of a letter which I had written to you outlining our research on rock dust usage since 1986. Part of this letter dealt with a long term trial we have started on September 19, 1988 which will carry on until January/February 1990, and possibly beyond.

The trial consisted of two 1-square-meter plots, one of which was planted in inorganic wheat, and the other with a biodynamic variety. Both plots were treated with rock dust North Carolina Phosphate and Egmont gravel, see analysis) at the rate of 1 ton to the acre (200" mesh), and the first harvest was taken in March 1989.

Enclosed for your information are the results of the two analyses. The first analysis of the two wheats was taken on June 23, 1988, and the analysis of the harvest was received on April 5, 1989. The figures quoted in the June 23 column should be taken as our basic starting off figures, and all future results will be referred back to them.

Both varieties of the grains recorded increases in nitrogen, phosphorous, potassium, magnesium, and zinc, while

there were falls in moisture, manganese, and copper. Samples of both of these wheat varieties have been put aside and there will be a further planting in the spring of 1989, and a further harvest in March 1990. I intend to increase the tonnage of rock dust to 2-3 tons to the acre in the spring sowing, but will still retain the same types of rock dust fertilizer.

The Soil Association held its annual conference in Nelson in the South Island this year, and I was asked to hold two more workshops on rock dust usage. The first workshop was a repeat of the 1986 workshop, but the second one dealt with research from 1986 to 1989. It covered the application of rock dust in the form of foliar spraying, homeopathic application, and the incorporation of rock dust into irrigation systems. In the case of the irrigation we have been adding a kilo of rock dust and 10 drops of potentized lucerne juice, potentized to 1000, and adding these two substances to 450 liters of water. When water is treated in this manner it will throw off a form of radiation which can be picked up by a crystal pendulum (see photos next page). When garden beds are sprayed with this solu-

tion they will react in the same manner, and will continue to react in this way for 6 months or more. We have grown very good vegetables which were grown on beds which were treated in this manner. I intend to spray irrigate some of the wheat plots in this manner during the coming season and will apprise you of the results. The introduction of rock dust in homeopathic form will enable us to be much more manipulative in our treatment of irrigation water. It opens up a system of what might be described as prescriptive treatment to water which is applied to plants in a foliar spray method. It will also, I hope, and believe, allow us to store large amounts of rock dust in a very condensed form for long periods without deterioration from weather and other aspects.

It is hoped that during this coming summer season we will be able to widen our scope of chemical analyses to take in some of the other type of vegetables and fruits which we grow in both our Dunrowin and Panorama gardens. We have been growing these different types of vegetables in rock dust-treated soils for more than 3 years, so we are now in an ideal situation to carry out further trials over a wider range of domestic plants and vegetables.

I will keep you informed over our future progress.

*Keith Gray
Rotorua, New Zealand*

Mineral Values variations in successive crops of organically-grown wheat, using rock dust as a fertilizer, and starting the trial with bio-dynamic and conventional (control) seed.

	Test 1	Test 2	% diff
Date of test	23/6/88	5/04/89	
Moisture	12.20	10.80	-11.48
(Control)	11.70	10.80	-7.69
Nitrogen	2.00	2.30	15.00
(Control)	2.00	2.70	35.00
Phosphorous	.38	.46	21.05
(Control)	.30	.49	63.33
Potassium	.39	.53	35.90
(Control)	.38	.56	47.37
Sulphur	.14	.14	.00
(Control)	.14	.15	7.14
Calcium	.04	.10	150.00
(Control)	.07	.07	.00
Magnesium	.12	.16	33.33
(Control)	.12	.16	33.33
Sodium	.01	.03	200.00
(Control)	.01	.01	.00
Iron (ppm)	36.00	45.00	25.00
(Control)	58.00	41.00	-29.31
Manganese (ppm)	34.00	32.00	-5.88
(Control)	36.00	29.00	-19.44
Zinc (ppm)	29.00	58.00	100.00
(Control)	33.00	55.00	66.67
Copper (ppm)	5.00	4.00	-20.00
(Control)	5.00	1.00	-80.00
Boron (ppm)	4.00	3.00	-25.00
(Control)	1.00	2.00	100.00

Egmont Rock

silica	40-42%
aluminum	13-14%
iron (Fe ₂ O ₃)	very low
iron (FeO)	2.3%
magnesium	1.5%
calcium	1.5-2%
sodium	3-4%
potassium	2-3%
phosphorus	1%
manganese	1%
titanium	.5%
water	2%

North Carolina Phosphate Rock

nitrogen %	0.1
phosphorus	12.8
potassium	0.072
sulphur	1.20
calcium	33
magnesium	.34
iron (mg/kg)	4300
aluminum	1650
manganese	21
zinc	3.50
copper	16
molybdiu	9



Testing the untreated water in our 450 liter plastic water tank. The crystal pendulum remains passing vertical.



The same pendulum in action after addition of 1 kilo of mixed rock dust (200 mesh) and 10 drops of lucerne juice potentised to 1000 D. A similar reaction can be obtained when the pendulum is held over soils which have been treated with the above liquid mixture.

The Remineralization Project

The Hamaker-Weaver message was intended to alert society to the full extent of the climate crisis and trigger a global remineralization effort in response. That approach involves public advocacy to make society and government fully aware of the problem and of the action required. It then depends on our government coming up with the proper response.

The Survival of Civilization was published nearly eight years ago with over 12, 500 copies now in print. There has also been additional literature plus the efforts of the Hamaker network. So far there has not even been a media breakthrough for our message. Despite heroic efforts and a few limited achievements the Hamaker message remains outside of public awareness while the "global warming" has become firmly entrenched.

Even if we were to achieve public attention and the government acted, the response might well be the wrong one. Again and again we see, well-meaning, but ill-conceived, programs that cost billions, help few, and are riddled with waste, mismanagement and fraud.

Meanwhile it's getting late in the game. No major remineralization programs have been started and none have been announced. The Worldwatch Institute, using its own research (which does not include Hamaker's work) has warned that humanity is facing very serious problems and the next ten years is our last

chance to turn things around. On top of this there was a news report on 10/1/89 indicating that the Bush administration was opposing the efforts by "...several nations to develop a treaty limiting emissions of the gases that contribute to global warming." The report continues, "The U.S. will contend that any such treaty should aim instead at increasing scientific understanding of the 'greenhouse effect' and its likely impacts. ...Protecting the climate, per se, is not our objective', the position statement says. 'Rather, our objective is to protect social, environmental and economic well-being from the adverse effects likely to result from global climate change.'"

Until recently there was a slow but steady increase in sentiment by Congress, and even the scientists who predicted global warming, that it was time for serious efforts to slow the rise of greenhouse gases. It would seem that Bush and his associates have killed any change for global action to restrain the deadly rise in greenhouse gases. It may now be almost impossible to overcome this blow by unified action from our Congress and by other governments who are at least ready for modest measures.

A number of us have been pondering the likely failure of government to respond as required. We want to try the alternative of taking our message directly to major organizations such as foundations (for modest funding) and then to selected corporations to open a dialogue that could lead to constructive action.

Specifically, we want to try and interest one or more major companies in remineralization as a sound business venture.

We have just completed a 32 page position paper designed to present a coherent and credible introduction to this subject. We will shortly be contacting a number of foundations for financial support but this process can be found in reference books so we can match our interests with theirs. But finding suitable companies is more difficult because there is no equivalent reference source.

Readers of this message may be in a position to assist us in locating suitable companies. The key factor is corporate management and their personal values and interests. Their line of business would be relevant but not entirely decisive because companies can decide to diversify into other areas of business. We will be developing our own lists of corporate prospects but your help will also be most welcome. The kind of help we seek is the company name and address plus a profile of corporate management and what interest or qualities they have that could make them receptive to the remineralization idea. We will then write to the company.

You may want to first examine a copy of our position paper and better understand our approach. The title is **The Remineralization Project**. You are welcome to order copies at \$4.00 each (printing and postage) from:

Bertram Cohen,
63 Whittier Blvd.,
Poughkeepsie, NY 12603.
(914) 454-3421.

Gravel and Rock Dust Sources

Contact person (rather than quarry site) listed as C. P.

U.S.A.

For grinders

Roy Browning-Nash
for grinding equipment in the Southeast.
(703) 920 1123

Grinders for lease at \$3500 per month. Grinders turn out 4-500 of very fine mesh rock dust a day at 600 mesh. If you find a large source of mixed glacial, river or ocean gravel that checks out with a pot test, and are ready to go into business, contact Gary Scott at (801) 358-6404 in Salt Lake City.

Associated Partners West
Novitt mineral supplement
P.O. Box 3048
Iowa City, IA 52244
1-800-522-4279

Minerals from Poland. A yearly supply costs \$175.00

Boddy Toddy
Health Mineral Supplement
Rockland Corporation
Tulsa, OK 74128
(918) 437-7310
(800) 331-3659

Mark Breen C.P.
RFD #1, Box 72
Concord, VT 05824

Brookside Farms Lab
for mineral analysis only
Director Mark Flock
308 S Main St
New Knoxville, OH 45871

Calico Rock
Cort Hooper
Barstow, California
(714) 699-6444

Clodbuster- Fertimax
Leland Taylor
701 Madison St N.E.
Albuquerque, NM 87110
Reported on in SR #11-12 and recommended by Hamaker. It is lignite, a soft coal, which contains minerals in highly compressed organic matter.

Richard Cottrell
8316 Lilly Stone Rd
Bethesda, MA 20817
See **Letters** this issue.

Tom Davenport
5764-F Paradise Drive
Corte Madera, CA 94925
A source for Greywacke, Clodbuster and U. S. Soil products.

Dr. Soils Glacial
Box 891
Captain Cook, HI 96704

Earth Circle
P.O. Box 6123
for agriculture and health supplement

Ele-M-ite
Kelly Park
8790 Blue Jay Lane
Salt Lake City, UT 84121
(801) 262 6279

Flora-Stim
Strite's Warehouse
P.O. Box 128
Greencastle, PA 17225
(717) 597-3325
A natural clay, rather than hard silicate gravel dust, high in minerals.

Genesis Farm C.P.
Box 622
Blairstown, NJ 07825

Gordon Fellows
for Mineral Analysis only
Suburban Experiment Station, Beaver St
Waltham, MA 02154

Henry Fleischman C.P.
36 Union St
Guilford, CT 06437

Gayle Hamilton C.P.
RR 1, Box 283
Aurora, IN 47001

Sam & Gordon Kaswell C.P.
1672 Wilson St
Eugene, OR 97402

Caroline Kimler C.P.
Box 5445
Bend, OR 97708

Lakeside Industries
2416 Hogum Bay Rd
Olympia, WA 98502
or write: P.O. Box 3004,
Lacey, WA 98503
(206) 491-5460

Laurence Lynch Co
Falmouth, MA 02540

Michigan Aggregates Corp
996 East Chicago Rd
Gerome, MI 49249
(517) 688 4414

This source is recommended by The Society for an Extended Ethic. You can contact Debra Vuckovich, 1139 Woodside Trail, Troy MI 48098 or Rosemary Szabo, 26606 Thomas, Warren, MI 48091 for advice.

Mt. Ark Trading Co.
120 South East Ave
Fayetteville, AR 72701
1-800 643 8909

The Notch (Lane and Son)
Rte 116
Amherst, MA
A source of traprock, very fine basalt that may be similar to San-Vita product in Austria used for regenerating forest in Brixlegg. The editor has had very positive results with it over a 2 year period.

Pacific Rim Soil
Additives Unlimited
P.O. Box 60183
Fairbanks, AK 99706
(907) 479-8941

Peaceful Valley
Farm Supply
11173 Peaceful Valley Rd
Nevada City, CA 95959
(916) 265 FARM

Yvonne Rado
P.O. Box 278
McKenna, WA 98558
Contact person for California, Oregon, Washington and the Western States for sources of gravel dust.

Rich Hill Quarry
Buckskin Township
Fayette County, PA 15425
(412) 626 0080

Bob Sniadach
Box 3582
Boynton Beach, FL 33424

Tilcon Co.
72. S. Main St
Acushnet, MA 02743

Trace Minerals Marketing
Organic Life Soil Min
300 Fremont #113
Las Vegas, NV 89101

U.S. Soil
Rick Arnold
7595 W. HWY 50
Salida, CO 81201
(800) 548-2560
(719)539-6611
Fax (719)539-4936

East coast distributor:
Tom Whitesell
Star Route, Box 165A
Canton, NY 13617

A gypsiferous shale product, rather than hard silicate gravel dust.

Vulcan Materials Co

editor: This list was submitted by an engineer of the company familiar with what we are looking for. SR has not confirmed the quality of the sources listed. Also, in the next issue will appear an article on environmental consequences of some of their chemical manufacturing operations.

Littleton, CO 80121
(303) 850 0689

Pat D Kerry
P O Box 29310
San Antonio, TX 78229

Joseph H Scott
Wayne P Robertson
250 Maclellan Bldg
Chattanooga, TN 37402
(615) 266 4872

Cliff Kirkmyer
P O Drawer 1590
Manassas, VA 22110
(703) 631 2060

Mickey R Love
P O Box 4195
Winston-Salem, NC 27105
(919) 767 4600

J Lloyd Sentell
P O Box 7
Knoxville, TN 37901-6001
(615) 579 2903

John T Douglas
500 West Plainfield Rd
Countryside, IL 60525
(312) 482 7000

con't page 27

**Jan D. Brewer
has researched the
availability of
low cost grinders**

***New, used and make
your own!***

New Grinders

**Action Mining Services, Inc.
4460 W. Reno Ave #D
Las Vegas, NV 89118
Tel. (702) 362-1511**

Cat #2836 "Ore Pulverizer" \$56.90-
this is a hand crank model that will
grind to 200 mesh

Cat #5005 "Impact Mill, Laboratory"
with motor \$559.00

Cat #5010—without motor \$349.00
grinds up to 100 lb/hour to 200 mesh or
finer.

They also have screens of 200 mesh
(and other sizes) so that the fineness of
the dust can be measured. Also ball
mills.

Make your own

Popular Mining Magazine

At the same above address for
\$15.00/year—send for sample issue and
list of back issues. They had plans for a
suitable impact mill made out of an old
lawnmower engine and a truck brake
drum for do-it yourself rock mill in their
July/August 1989 issue. Their back is-
sues contain plans for a number of oth-
er rock mills.

Other "Ore Pulverizers", ball mills,
etc. are available from:

**Bico, Inc.
P.O. Box 6339
Burbank, CA 91510**

Used Grinders

**Prospector's Advertising Service
5785 CM Hermosillo
Atascadero, CA 93422
subscription \$10.00/year.**

Maine Seaweed Company *makes an offer!*

Normally, during glaciation-remineralization, fierce winds pick up sea solids as they travel over the oceans, and they rain out over the land. Why not let UPS bring it to your door, rather than a tornado bringing it to your frozen backyard tundra?

Occasionally, friends and customers will request seaweed scraps for animal food supplementation, compost piles, and general garden remineralization.

Some of us are reading *The Survival of Civilization* by John D. Hamaker and Donald A. Weaver (ISBN 0-941550-00-1), and we know that crushed minerals are necessary to most of the earth's demineralized surface, since we are at the end of the interglacial period. If we do not succeed in remineralizing the surface of the earth (this normally occurs during the glacial period), plant life which is dependent on soil minerals will then diminish, thus increasing atmospheric carbon dioxide. The resulting cloud cover will send us into the next glacial period.

Hamaker's predictions are that this will occur within this decade; already we can see changed weather patterns which foretell the loss of the temperate zone, and thus a stable food supply. The planet is ravaged by forest fires, hurricanes, drought, and floods. I urgently recommend that you read Hamaker, for a better understanding of how this is all interrelated.

Along with the application of crushed rock, Hamaker recommends the application of "sea solids" as a source of necessary trace elements. This year, I have 400 lbs of kelp scraps, which I offer at \$3.00/pound, shipping paid. (One dry pound represents fifteen wet pounds of kelp.) All I ask is that you order in five pound increments. Next year, I will elec-

trify our hammermill, and offer seaweed in finer chunks. If you are interested in this product, (price will be the same), let me know, and I'll start a special mailing list.

The kelp scraps I'm offering this year are suitable for compost piles, mulching, or animal food. If you like a foliar spray, you may soak and strain the kelp ... but please use the solids in your mulch or compost! Any way you look at it, the minerals will eventually reach the land. From the human point of view, that's better than 90,000 years of glaciation, with 200 mph winds shrieking from desert equator to the frozen ice caps at the poles, with no stable temperate zone in between.

Send me pictures of your green gardens and lawns. I'll publicize your efforts in the next mailing. If we can plow and deforest the earth, we can also remineralize the earth. We simply need to change our priorities, until earth becomes a green and peaceful spirit-garden.

Hamaker's book can be obtained by writing Hamaker-Weaver Publishers, PO Box 1961, Burlingame, CA 94010. Book price: \$12.

Larch Hanson
Cynthia Bullington

**Maine Seaweed Company
PO Box 57
Steuben, Maine 04680
(207) 546-2875**

Questionnaire for the Pulverizing Industry

Dear Pulverizing Manufacturer,

I would like to purchase a pulverizer that meets the following requirements:

-the raw input material can vary in size and hardness precisely the way glacial gravels and silicates like basalt and granite do but need not exceed approximately 3" in diameter if that allows us to limit ourselves to one machine.

-The end product must be at least 80% 200 mesh and some finer well contained dusts at least with a target capacity of 1/2 ton per hour, more or less.

-Power source preferably truck mounted and powered. (we realize that may be asking a bit much)

-low wear and easily replaceable parts goes without saying.

I am organizing a semi national campaign to test and prove the food and biomass growth and quality differences resulting from fresh local glacial dust conditioned soils.

The tank in the picture on the flyer is mounted on one of many 18 wheelers kept busy by a stationary pulverizer at a basalt quarry in Austria. Inquiries welcome.

Piet Bouter

Letters and Forum

John Hamaker
to Kemal Pince in Turkey

Kemal Pince writes from Turkey that he has tried some dust found near Istanbul on his garden with good results. Now he is working with a dust of the following composition:

SiO ₂	67.31%	31.5%	27.1%
Al ₂ O ₃	18.27%	8.3%	8.1%
CaO	7.17%	5.1%	3.6%
Fe ₂ O ₃	4.83%	4.1%	5.0%
TiO ₂	1.02%	0.6%	0.4%
Alkalis*	2.27%		
+ Trace Elements			

*Sodium 2.8%
*Potassium 2.6%

To find the percentage of the non-oxygen elements I looked up the atomic weight of silicon and oxygen, for example, and found the weight of one atom is Silicon plus two atoms of Oxygen and multiplied the weight of Silicon divided by the total weight times 67.31%. My slide rule percentages are in the third column. In the Spring 89 *SR* on page 19 is a table giving the abundance of elements in ppm. To convert to percentage just move the decimal point four places to the left. The percentages are shown in column 4. The alkalis are sodium and potassium, which from the table are equal to 5.4% as compared to 2.2%. Note that the total of column 2 is about 101% and it should be 99 and a fraction %. Magnesium at 2.1% in the table is not shown at all. I would prefer to have every element down to .1% shown and the presence of some of the trace elements listed as "trace" found as for example zinc, copper, and cobalt known to be essential.

Kemal is counting on the Kervran findings that some of the light weight elements like phosphorous, potassium and calcium can be formed from other elements by the cell's ability to manipulate the electrons in the outer ring of atoms to make the sum of two elements add up to the atomic weight of another element. I'm inclined to agree that happens. Kervran makes a strong case. It is hard to see how phosphorous at .118% could recycle in place for anything like 10,000 years even though recycling is very efficient.

The test is incomplete and not too accurate. Nevertheless, the similarity between columns 3 and 4 is enough to encourage one to go ahead and do growth tests. This is what Kemal is doing. I would advise him not to grow radishes in plastic bags as proposed to disorient from external influences. With plants needing CO₂ and giving off oxygen it seems to me that growth would be stopped or badly stunted.

Kemal has joined with the owner of a brickyard who has the necessary equipment. This is a refreshing example of free enterprise with a good chance for success. Let's hope so.

John Hamaker

I was especially interested in John Hamaker's discussion about sands in his column about work in deserts and arid regions. This region of Mexico has apparently limitless supplies of volcanic sand that is actually volcanic ash piled up in mountains from eruptions ages ago. Nearby there are several mountains of such sand which are being excavated and hauled away for use everywhere in making cement. This sand is very cheap. I have been adding it to my flower pots and garden soil since I have been here. It ranges from fine dust to coarse granules.

A neighbor has told me that he remembers the eruption of Paracutin over forty years ago. Although that new volcano is about 40 miles from here, the Pátzcuaro region received smoke and ash for years and the descent of ash, which was quite thick, produced fantastic crops of beans and corn. The soil was apparently remineralized 40 years ago and is still quite rich. I plan to experiment with plots this coming rainy season with some supplemented with sand and some without.

B.J. Tudja
Patzcuaro, Michoacan, Mexico

For some time I have been interested in using rock dust on my farm, which has had bio-dynamic treatment for 9 years. After meeting Keith Gray near Rotorua in New Zealand in June, I am keen to contact your Soil Remineralization group and hear of research results and what is going on throughout the world. Keith Gray has done several years using homeopathic quantities and I am particularly interested in this, and also what quantities need to be applied in normal application.

Also using bio-dynamic methods I would like to know if rock dust still brings benefits, and if the quantities used are small, as is used with rock phosphate, wood ash, and lime which we only apply when sowing lucerne. The pH rises naturally with the bio-dynamic process.

I have read some of the Hamaker and Weaver writings; I have the video *Stopping the Coming Ice Age*.

What machines are available for small and large scale production?

P.A. Spurgeon
Narrikup, Washington

editor: can remineralization benefit biodynamic farming? I would think so and be curious to see the result. Alexander Podolinsky has recommended it to one farmer who subscribed to the newsletter and also a quote advocating rock dust by him appeared in a past issue.

My interest is in the design of rock dust grinders and also the general news about success and what is happening in the world. I will mention your newsletter to a local magazine in New Zealand that I think may be interested in it.

Warren Pearce
Napier, New Zealand

Thank you for the informative and supportive link with other *SR* members. Another wonderful and hopeful magazine!!

I am disturbed to hear that criticisms have been made of *SR* publications. I do not feel it is technically oriented at all—only acceptably so. It is always thought-provoking that while many positive complimentary and grateful comments are forthcoming the one which criticises is the most effective.

J.E. Wilton-Hill
Armidale, Australia

Enclosed please find a clipping from the local "Everybody reads it", right-wing "News-like potato chips", tabloid called *The Province*. Perhaps you will want to follow up on the Battelle Institute and Greg Koller. They must fit into the cooling theory of Hamaker somewhere.

Experts Say It's All Hot Air
EVERETT, WA — Scientists in the U.S. Northwest are throwing cold water on the "green house effect."

In fact, they think the world may be cooling off. "We don't know enough to determine whether there is a greenhouse effect," said Greg Koller of the Department of

Energy's Battelle Institute. "There is a lot of theory out there that there may be a cooling trend going on."

The "greenhouse effect" refers to the warming of the planet caused by pollution.

A team of 25 researchers will take to the air and sea off the coast of Washington next month to study cloud patterns.

The researchers want to see how sulfur and nitrogen compounds are exchanged between the Pacific Ocean and the atmosphere.

These compounds may create or alter cloud patterns that could cool the earth's surface.

Liz Thor-Larsen

Vancouver, B.C., Canada

editor: I have not been able to find information on Greg Koller and the Battelle Institute. Any information from SR readers would be very much appreciated. This sounds really interesting.

I have just finished reading Larry Ephron's book *The End*, and I was particularly excited by the information he gives on the potential of remineralization of agricultural and forestry ground with glacial dust.

We stay on the northwest coast of the Highlands on marginal ground but on top of some of the best rocks in the world! I feel that if his case can be proven then it holds great potential in this area for rejuvenating our crop ground and regenerating native woodlands. Also, if widespread support can be gained, increased employment opportunity in our quarries.

I am hoping to convince a Trust to help sponsor me on a trip to visit sites where remineralization has been applied and to access available data. I would also be interested to investigate the production and marketing of glacial dust. Any thoughts of useful destinations and contacts would be greatly appreciated. It looks as though I may be able to work in a visit to the States and perhaps one other country, maybe Austria.

I feel genuinely that remineralization would have a startling effect on agriculture and forestry in the Highlands and would like to do all I can to promote it.

Clive Sheppard

Stoer, Lochinver By Lairg
Sutherland

Thank you very much for sending me the Spring Issue, 1989 of *SR* Newsletter, which is very informative and relevant to the problem of disturbances of ecosystems affecting the world today.

The "Climate as a Human Right" Issue article by Greg Watson is most interesting to me because our ideas run parallel, especially on the issue of sustainable community development, think globally and act locally, and many others.

In this connection, may I request to please refer or forward this letter to Mr. Greg Watson to facilitate an open communication with him. In this regard, once our program, **The Real-Infanta-General Nakar Bioregional Development Program** is finished, I will send him one copy for technical evaluation. The program is self-explanatory, blending ecological balance, sustainable community development with modern technology.

Abelardo A. Mercado, M.D.

Quezon, Philippines

On page 25 of your Spring 1989 edition you refer to there being a list of 80 quarries in the UK. Does this mean that there are already 80 quarries who are prepared to supply Rock Dust? If so, do you know where I can obtain this list?

George Ripley

Makepeace
Findhorn, Scotland

editor: The list of 80 quarries is part of the address listed under Gravel Sources—Redland Aggregates, Ltd, David Langley, Technical Manager, Bradgate House, Groby, Leics LE60FA. This information was sent from a subscriber in England. You will need to contact Redlands to inquire. I would be happy to know the result with which to update the information printed in the newsletter. I have also requested a reply from the company.

First and foremost, I should thank you for sending the copies of *SR*, gratis. This is specially so, because **Association for Propagation of Indigenous Genetic Resources** (APIGR) is basically a networking organization, drawing together the experiences and knowledge of organizations and concerned, committed individuals, who are involved with the preservation of indigenous genetic material, both plant and animal—as also, related socio-environmental issues. As such, it has little, or practically no funds to speak of, and has been depending on the voluntary contributions and goodwill of its members for organising its meetings, etc.

The issue of soil remineralisation is certainly exciting and interesting. However, there are a number of questions that come to my mind, but I think on attempting similar work here: how to get started; what would be the financial outlay; where does one raise this finance; what kind of knowledge background is essential; what organisational support facilities are required, etc. In addition, practical questions, like: what kind of rock supplementary to use; how to identify it; is it based on soil sampling; if so, what kind of soil analysis should one do; how does one work out the proportion of rock powder additive; any special requirement vis-a-vis water; what are the agronomic practices, if any, specific to this; what varieties and crops have responded better, i.e., local vs. hybrids, etc. I do realise that some of these would only come through experience building at the local level here, and that the experiences/experiments you have indicated may not be appropriate to the Indian situation—especially the local area. One could probably get rock dust samples from the suppliers' list you have given but that again does not seem to make sense because, we in India should be having rocks which would suit our area best. In addition, the Government may frown at such attempts to bring rock dust from outside the country.

I do not know if you have any ready material, like a detailed primer (the one given is too general in nature) on these various questions. Even if you do not, but can give us some broad guidelines, then we could probably give it a try. May I count on your renewed help and support in trying to get your ideas shape and substance, in our area of work?

Korah Mathen, Secretary
Association For Propagation
of Indigenous Genetic Resources
Ahmedabad, India

Bertram Cohen responds to Korah Mathen:

Thank you for your inquiry on soil remineralization methods. Previous issues of the *SR* newsletter have carried various suggestions on remineralization. At this time the approach is largely an individual and amateur operation. There are differences in soils, the quality of rock dust and other variables. That means results will vary and some experimentation is in order.

In the spirit of networking we encourage those readers with personal and successful experience to write to Korah Mathen directly and share what you have learned.

There is a great need for soil remineralization to be put on a more solid basis in all respects including the elements of support mentioned in Korah Mathen's letter. There is an attempt among some people in the Hamaker network to

approach various corporations to try and interest them in setting up serious remineralization enterprises. This would make the process widely available in a far more practical and dependable form than at present. This project is in the formative stage and corporate contacts may begin in a few months.

editor: a research packet is available from SR newsletter that could be very helpful. (See page 11 for details)

IN THE U.S.

I keep reading that it is the balance of trace elements in powdered rock that gives soil life and plants rapid healthy growth. Has anyone studied the thousands of compounds of these elements to see if it may be catalysts doing the work attributed to micro-nutriments? It could be both acting together, or other factors playing a part.

Tom Blose
Cochran, Pennsylvania

John Hamaker replies:

Minerals are worthless until they are used by the micro-organisms to build the million plus compounds that give life to the cell. That is true of those in the soil and those in the intestines.

Many of those compounds are catalysts which promote various actions required to maintain life. The minerals are a part of the catalysts and the broad range of minerals is required to produce all the catalysts. If some elements are missing from the soil everything which grows on that soil will be less than healthy.

J.D.H.

Regenerating Sugar Maples in New England

I am doing my best, informally, to spread the word about *SR* whenever an appropriate person or opportunity arises. I especially would like to compliment on publishing the 2-page *Basic Primer*. This will be quite useful for me to distribute. I would also like to compliment you for your openness and good sense (for example, for emphasizing that in promoting *SR*, the climate change is a major issue, but one need not force people to first accept that we are having global cooling—for whatever the future, *SR* will help stabilize the climate as well as many other good effects).

Your plan to develop a very practical newsprint edition for widespread distribution is also a good idea. I wish you luck with getting that out.

I'd like to suggest an idea which you may already have thought of: since I've been hearing so much in the news recently about the devastation of the local Sugar Maples, why don't you and Greg Watson co-sponsor a conference specifically aimed at Massachusetts and Vermont, etc. Sugar Maple owners/workers in that industry, to discuss the benefits of *SR* particularly for that industry. If you know of any people who've actually done soil remineralization on Sugar Maples, they certainly should be speakers; but otherwise, anyone who has done soil mineralization on trees in the Northeast might be considered a relevant speaker and resource. This conference could be co-sponsored with other groups, too, such as NOFA. I've done several conferences, and it's possible to do them on a small scale at low cost. I'd be glad to talk with you about this more if you think it is a good idea.

Barbara Brandt
Somerville, Massachusetts

I've been hearing and reading about soil mineralization and would like to learn more. We have some land in need of aid, in particular a sugar bush, and I'm wondering if you

know of any work that's been done with maple sugar tree forests. Enclosed is a cheque to cover a year's subscription to your newsletter. I look forward to hearing from you.

Mary Ormrod
Cavendish, Vermont

editor: It is hoped and very possible that the Massachusetts Maple Growers Association and the New Alchemy Institute will come together to monitor the remineralization of sugar maples, in the near future.

Large Source of Rock Dust?

Last May I had a discussion with Jim Prescott regarding soil remineralization. We had both speculated that a possible source of material for S.R. exists here over the iron range of northern Minnesota. There are huge quantities of rock and low grade ore in this area. Most of the mines have been shut down for years and much of the equipment used during the active mining operations for crushing and processing ore remains idle. I do not know whether it would be feasible to convert these plants for soil remineralization or not. It does seem worth exploring, though.

Robert Gephart
Grand Rapids, Minnesota

Back in the spring of 1987, after reading John Hamaker's book and talking to Joanna Campe, my wife and I decided to try some glacier silt. Since we live on the Chesapeake Bay in Maryland the closest source was southwestern Pennsylvania. Having relatives in Connellsville, we drove there and obtained a ton of stone crushings (they call it bug dust) for \$5.00 from the Rich Hill Quarry just outside of town (tel. 412/626-0080). List as rock dust source!!!

The results on our garden, shrubs and trees, have been quite gratifying. The first year our tomato plants grew to six feet. Our Holly tree's growth accelerated by 50%. Our soil (mostly clay) is poor and the general improvement has been impressive to us.

One more thing: I'm sure sad to see Azomite go! It seemed to take the gray from my hair enough to change my hair's appearance from frosty to very dark, where the gray is really unnoticeable. The thing I like the most is that this tells me that the minerals are being absorbed by my body in the more crucial areas also. Is there a new version of Azomite?

David M. Butler
Stevensville, Maryland

editor: Readers can write or telephone Kelly Park of Ele-mite (in Gravel Source list) and ask when Azomite mineral supplement will become available again. This might spur interest in going through the process of getting FDA approval and marketing it again.

After coming upon the video *Stopping the Coming Ice Age* and the book *The Survival of Civilization* I have become completely committed to soil remineralization.

I have stumbled upon a pile of rock dust that was produced from construction excavation waste. At one time "rock dust" was an allowable admixture to asphalt paving material due to its 100% compactability. Change in the controlling interests of the State Highway Department have rewritten highway standards to no longer allow the inclusion of rock dust. The Pile I have found is still being growing, simply for the sake of reducing the volume of the scrap rock and being able to use the dust as a landfill.

I have been detective-ing the entire operation and have purchased and spread a few loads of this rock dust. I have already realized the main cost to be in public education and transportation, at least with the rock dust operation I have found.

I have not broken the news to the owner of this operation yet about what they have.

I would like to gather information and insure that three things happen regarding this rock dust, if it is of sufficient quality to be of value to the remineralization effort prior to addressing the owners head on:

1. Establish a marketing system which would provide for continued investment of profits into public education.

2. Provide the rock dust at a fair market rate (right now they say they will sell at \$4.00 a yard or less as it is now basically considered waste).

3. Establish a job for myself and others as they might come forward with a commitment to talk to people.

I write you because I believe you are in a position to help me keep from reinventing the wheel and getting things going as soon as possible.

How do I test the rock dust? Laboratory? How have other people established markets? After spreading rock dust on a few yards I got cold feet realizing that all that I knew about the rock was that I saw a pile of broken rock from the excavations and a pile of dust at the end of a hopper. There I was spreading it on people's plants, grass, trees, without any idea what it would do (other than from what I read in the one copy of the newsletter which I have (Fall/Winter 88). Everything turned out well except that my truck (a 1977 GMC pickup) quickly died from over work.

Several months ago while writing to all of my congressmen/women, senators, etc. about this subject I sent a copy of the **Stopping the Coming Ice Age** video. The video sat in a stack, I guess because, I had no response so I called back. Finally Congresswoman Connie Morella has watched it and has seriously rethought her position on the co-sponsorship of the Global Warming Bill.

I have a group of friends who are involved in Radionics and psychometry, if you are familiar with this field. They have come across a "rate" which is supposed to enhance the energy of the rock dust.

I have said a lot, asked a lot, and offer myself as a representative of the cause in the Washington, D.C. area and would like to have my name added to any list of sources.

I salute you and your efforts and hope to communicate in the future. I am a caretaker of the Earth.

Richard Cottrell
Bethesda, Maryland

Would like any other info as to what, where, etc. I've also been using rock dust from paving plants and rock crushers for years but didn't realize the glacial flour and silts were also good... or better-loaded with it up here. The garden (organic) has always been good, looked like a jungle in town.

Bill Atwood
Warilla, Alaska

Grinders, etc

SR is a critical network for the survival of Mother Earth and her family—don't let it die!

I and John Hamaker and many others know it's discouraging when a project does not pay it's own way. But, we knew the project had to be done for vastly more important reasons. We're old and have exhausted both our bodies and our resources; we need your talent and youth to carry on.

I still have a few postage stamps and some time so I am collecting information and prices on small scale off-the-shelf rock grinders that are available now, since that seems to me to be essential for many people with local rock sources. I'll send this list and information to you as it comes in, for you to include in your resource section. (See page 19)

Jan D. Brewer
San Luis Obispo, California

I have been quite disappointed that Mark Williams apparently hasn't gotten a workable rock grinder on the market yet. It appeared for a while that he would have a grinder in some smaller sizes that some of us could afford. Frankly, I would be happy with one that could be bought for under a thousand dollars and might perhaps turn out 50-100 lbs of fine dust per hour. The Japanese seem to be clever at inventing small machinery. Perhaps someone could get them interested in producing a small grinder. I've made small amounts of dust using hand methods and it doesn't take very long to turn out a couple of pounds of pretty fine stuff but I am 65 years old and it can get pretty tiring. Would surely like to hear more about Bob Cannard's methods in the next **SR** if at all possible. Please keep the newsletter going if you can. We love it.

Hubert Schoonmaker
Clyde, New York

editor: See Resource of Jan D. Brewster listed on pg. 19

Attached please find an article for the remineralization newsletter on a project carried out last year. (see page 11)

Attached is a paper I wrote for the 15th Congress of the Canadian Solar Society in Penticton, B.C. in June 1989. My research has provided some evidence that would give credence to Hamaker's theory. What I do not understand is his insistence that we are in the last 20 year phase of forest decline. Woillard's findings indicated the disappearance of deciduous trees over a period of 100 years and a 20 year period within which needle trees disappeared. Although both types are presently dying of acid rain, the late frosts in May in our area were not able to kill trees yet although they had already fully developed leaves: A new set of leaves re-sprouted to replace the frozen leaves. It could be that sharply rising food prices in the next decade will bring remineralization into focus.

Eckhart Stoyke
St. Albert, Alberta, Canada

Secrets of the Soil

We have a ranch in southwestern Colorado, near Durango. If you know of other subscribers to the newsletter from this area, I would like to be in touch with them.

Presently, we are living in Arizona, but hope to be back on our ranch by spring to begin farming and growing our own food. I have just read **Secrets of the Soil**. We plan to use many of the modalities described in this exceptional book.

Our eventual goal is a holistic community of those interested in Bio-dynamic farming and spiritual values. We are looking for like-minded young people interested in a rural life and in becoming participators in our self-sufficient, spiritual community. We appreciate the fine work you are doing.

Dyana and Tex Mankins
Sedona, Arizona

Just finished reading **Secrets of the Soil** and it was incredible! Find enclosed check for \$12 for the newsletter. I am also interested in any more information I can get regarding soil mineralization. I would also like to talk to you or somebody regarding a possible film on this topic that I want to make.

Galen Fultz
Mill Valley, California

Just read **Secrets of the Soil** by Tompkins and Bird. I have a farm in north central Missouri. I'm very interested in the ideas put forward in the book, especially on remineralization. My farm has a lot of glacial till that I could put to productive use if I could grind it up.

Rod Jermanovich
Spickard, Missouri

Enclosed find a check of \$12 for another year of re-subscription to your wonderful publication. Each time I receive a new issue I am strengthened and uplifted in my resolve to bring to fruition the commitment of the **Save Our World (SOW)** organization to sow:

1. Seeds of plants to feed the hungry.
2. Seeds of trees to regenerate our biosphere.
3. "Seeds of rocks" to remineralize Mother Earth.
4. Seeds of knowledge to bring understanding.
5. Seeds of love to engender harmony and World Peace.

Enclosed also find another check for \$25. Please accept this small donation as symbolic of the support and love we have for you and your dedicated work.

Can you tell me who is distributing Peter Tompkins's new book, *Secrets of the Soil*? I would like to purchase a copy.

In your latest issue of *SR* you state that Mark Williams is back in business. I was delighted to learn this and have dispatched a letter to him ordering some of his "stone flour."

I am writing a booklet putting forth my thoughts and philosophy relative to "Saving Our World." I will send you a copy when it is finished.

Harold Elder, President
Save Our World
Miami, Florida

editor: Secrets of the Soil by Peter Tompkins and Christopher Bird is published by Harper and Row and is available from your local bookstore or can be ordered.

I am looking forward to receiving your newsletter and getting in on the network. I showed the tape to two friends who work at the North Carolina Botanical Gardens and they are ready to show the world and do something. Thanks for the information.

Jane Norton
Durham, North Carolina

Enclosed is a complimentary copy of *Global Citizen*, a budding international newsletter. You will find a mention of your newsletter on page 11, as a source for rock dust. Please send me information on your activities and put me on your mailing list. I would be interested in more information on rock dust, as well as anything else you feel would be of national and global interest for my publication.

Charol Messenger, Publisher/Editor
Global Citizen
11886 Claude Court
Northglenn, Colorado 80233

If you read *Spotlight* newspaper you already know. They had a book review on *Climate and the Affairs of Men* by Iben, Browning & Nels (about 1976 printing): "The evidence suggests the planet is not warming but is in danger of a drastic cooling—a worldwide cooling off that Dr. Browning suggests will be monstrous."

Tom Blose
Cochran, Pennsylvania

Enclosed is our personal check for \$12 for membership in your soil remineralization network. We've recently moved from Florida to a 25-acre farm here in the mountains of western North Carolina and have within the past month become aware of Larry Ephron's book *The End* and the video based on the book.

We are now researching sources of gravel dust and also gravel grinders so whatever information your network offers will be gladly accepted. We have within the week been warned against rocks containing feldspar as being a cancer-causing agent—is your group aware of this?

We appreciate your efforts and those of others who have

organized this network. We do much networking in this area—there are hundreds of us in these mountains who share similar ideas on many subjects. It is useful to do something about a challenge. Who knows; one might just be the "hundredth monkey"!

Bill and Doris Isely
Franklin, North Carolina

editor: I would like to invite readers to respond if they have any information on feldspar as a cancer-causing agent.

My farm is 13 acres of blueberry and raspberry, one produce acre, 4 acres of firs and spruce, and one compost heap in my mind. The interest [in soil remineralization] arises from a perplexingly possible drop in crop yield (though the bushes look great) and from the lack of organic matter in the soil. In other words, I have sick soil. Creating organic products in future will be a pleasant bonus, though I doubt I can become completely organic. Fungi are the main problem.

By the way, I am fortunate in that Vulcan Materials has a quarry within 10 miles of here.

S.D. Kelsey
Banner Elk, North Carolina

editor: Fritz Leitpold has documented tremendous success on apple orchards with fungal problems in the SR Research Packet and SR #10, 1988.

I'd like to see your research packet. If I may borrow it, I'll be glad to pay the postage. Current status:

1) 1 1/2 acres under heavy manure and sawdust mulch—only thoroughbreds and Arabians. Also granite dust.

2) Currently composting each bush of another acre with 3 spadefuls of compost plus granite dust, to be mulched as above. The compost, @ \$250 per load of 1 1/2 – 2 tons estimated, and granite @ \$105 per 9 tons is not stretching very far and will be halved—no diminution in amount of mulch.

3) Happily, soil analysis shows the 1 1/2 acres mulched last January has better (slightly) numbers than its neighboring control lot. Could be coincidence.

I am putting 9 tons of granite dust, plus compost and manure/sawdust mulch on 2 1/2 acres of trees. What's my next step?

Jack Kelsey
Banner Elk, North Carolina

editor: Report to SR on the results!

I need any information available on the use of rock dust in compost. Perhaps your readers will write *SR* or to me with their experiences in this area. If you have any copies of articles, I would send you postage—let me know, please.

Renee Denski
Plymouth, Michigan

editor: An excerpt from SR #3-4, 1986:

"For compost Helmut Snoek recommends 1 lb per 3 sq ft on each layer of a 2/3 ft high and a little less when the dust is extra fine. Don't forget a handful of dirt to inoculate with organisms and try to keep the N-C ratio 1-10. If there is a lot of manure around, you can't mix it with rock dust too soon for immediate improvement of the air and end product. Raw manure is detrimental until composted. Rock dust absorbs the ammonia, 80% of which gets lost to the air otherwise.

Some remarks from the Lubkes (soil specialists often appearing in *Acres, U.S.A.*) on compost:

"Compost heats up faster with rock dust. (do not allow to exceed 120 degrees) Rock dust improves aeration and structure and therefore prevents rotting. Aim for a compost with 30-50% organic mass. 60-80 lb per ton is considered optimal with fine ground rock dust."

Piet Bouter

editor: these recommendations were made with the use of very fine rock dust as sold in Europe i.e., much finer than the rock dust normally found and used in the U.S. This should be taken into consideration.

I attended the "Seventh Fourth World Conference" two years ago in San Francisco. I found the presentation with you, Fred Wood and Don Weaver just what the Japanese connote as shibui—the understatement as effective. I welcome the input of Larry Ephron as well.

In your Spring issue the part where Watson and Hamaker have a so called dialogue—Hamaker's contention that Ho-Ping "Food for Everyone" by Gabel is based on tonnage is an indicator of the reductionistic side of Hamaker's thinkings. It's a mixed book with a multiple set of lines on ways to go with practical steps; Jose de Castro's statement in "Geopolitics of Hunger" that the less food there is the more offspring there are is a difficult one for the ones that subscribe categorically to the Malthusian argument.

I mentioned these works as well as the work of Jonas Salk and his sons to Hamaker three years ago. He responded that he had not read these people—a little less than logical for one who professes a logical approach. Francis Moore Lappe and Joseph Collings have similar things to say. I think our problem is that we think we know. Yet do we?

Nick F. Consoletti
Portland, Oregon

Gravel Sources

continued from page 20

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an excerpt from a review of

***Secrets of the Soil* in American Laboratory**

**The editor's page
Science, understanding,
and the
extraction of wealth**

By Frederick I. Scott, Jr.

The obligatory hope expressed by the authors remains unpersuasive, however, without reason to expect changes in the forces that have brought about the present state. Note, for example, that their painstakingly pursued chronicles reconstruct the remarkably intricate methods of some ancient civilizations for enhancing the fertility of the soil. Could it be that those methods were devised in desperate attempts to retain or regain soil fertility then diminishing as a result of the loss of available minerals as John Hamaker and others suggest occurs causally between the periodic glaciations that have occurred over the past three million years? Could it be that the methods failed to save those civilizations because, in the absence of deliberate remineralization, the societies collapsed when food produced from the mineral-depleted soil no longer nourished adequately the mental

and emotional strengths needed to sustain a society?

Travelers to the semi-independent kingdom of Hunza, a remote and difficultly accessible valley in Pakistan surrounded by the highest Himalayan peaks, attest the superior mental and physical attributes of its inhabitants. The Hunzakuts, as the natives choose to call themselves, are described as the healthiest, happiest mortals, many of them centenarians, excelling in grace, charm, and intelligence. Their diet, sparse but uniformly reported as delicious and satisfying, grows on fertile soil carefully tended and maintained. The children display no evidence of juvenile delinquency or the normal childhood diseases and do not become neurotic adults.

The real secret of their healthy, essentially disease-free, existence appears to be the water, a glacially derived "milk" of colloiddally suspended mineral constituents.

Rats fed the diets of the Hunzas and neighboring peoples mirrored the attributes of the peoples from whom the diets were drawn. The rats fed the Hunza diet grew rapidly, never seemed to be ill, mated with enthusiasm, and produced healthy offspring. Gentle, affectionate, and playful throughout their lifetimes, autopsy showed that there was nothing wrong with their organs. Rats that were fed the diets of other peoples contracted the same diseases and even seemed to adopt certain of the nastier behavioral characteristics of the people whose diets

they were fed. Many of the rats had to be kept apart, snarling and vicious, to prevent them from tearing each other to bits. Autopsy revealed extensive afflictions in all parts of their bodies and systems.

Could the dramatic increase in previously unknown chronic diseases during the latter part of this century reflect drastic declines in the mineral content of our foods? Several researchers have reported links between nutritionally poor and toxic dietary intake and delinquency, crime, and learning disabilities. It is known, too, that the autonomic nervous system conserves its resources in time of life-threatening injury and deprivation by shutting down, hierarchically, higher faculties of body and mind in favor of basic survival functions. Could jelly-bean nourished leadership (and followership) mark the operating level of our higher faculties as some autonomic societal nervous system shuts down to contend with a mortal challenge? Could the increasingly pointless internecine struggles within humankind and between it and its planetary cohabitators for at least the past 2000 years be causally related to soil mineral depletion?

Frederick I. Scott, Jr.
American Laboratory

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The Network

Subscribers are invited to join the listing, so please let us know so we can include you. You will be listed once for every subscription or every three issues.

Giselle Allison

201 Edgewood
Laporte, TX 77571
(713) 471 8278

I'm a student, a gardener, and will be going to naturopathic school.

Phil Barnette

Star Route 157 Cedar Creek Road
Black Mountain, NC 28711
(704) 669 2814

Joseph Bednarz

425 S. Plymouth Blvd.
Los Angeles, CA 90020
(213) 935 0683

Fletcher and Grace H. Blanchard

Box 2668
Northville, NY 12134
(518) 863 6289

Stephanie Sable-Bierman

6437 Irwin Circle
Oakland, CA 94609-1122
(415) 658 9649

I am trying to awaken senators and heads of states in various countries to the imminent global weather crisis and provide viable solutions provided they act immediately. I need good color photos of the effect of rock dust on garden produce compared with controls.

Sam Catalano Jr

594 Innisfall
Queensland, Australia
(070) 644 118

Pacific Mineral Developments Ltd.
Interested in producing mineral dust and developing markets.

Gary Clausheide

P.O. Box 389
Putney, VT 05346
(802) 387 4429

Part time farmer (organic grains and dry beans) interested in *SR* and starting farmer/consumer cooperatives.

Robert N. Cloughley

R.R. #3
Newmarket, Ontario
Canada L3Y4W1

I am retired from IBM and I am trying to set up a rock dust industry in Canada. I have a 200 acre farm which needs rock dust for rejuvenation.

Nick Consoletti c/o Stalling

1825 S.E. Morrison #1
Portland, OR 97214

1. learning with others the art of dialogue sort of as dr. david bohm has been doing. 2. making bucky fullers geoscope a tool that makes it possible to model world or earth as a whole 3. mass production of dome geodesic where appropriate.

Edward H. Dorn

3 Worcester St
Taunton, MA 02780

Wendy Feldman

325 Delgado St
Santa Fe, NM 87501

Brother Alois Goldberger

Regional House Ubbog
Bangue, Abra4
Philippines 2800

Kathleen Lamont

P.O. Box 626
Rainier, WA 98576
(206) 446 2418

Want to network with others in the Pacific Northwest.

Bruce Miller

331 Palmerston Blvd.
Toronto, Ontario
Canada M69 2N5
(416) 962 4995

Organic farmer involved in milling equipment.

Jan Nilsson

Moody Hill Farms, Inc.
Box 171
Amenia, NY 12501
(914) 373 8650

Keep us in mind if you are looking for compost to mix with rock dust.

Stanley H. Owens

1210 East 11th St
Duluth, MN 55805
(218) 724 1544

I live in the city of Duluth, on a slope. The soil is clay. I have a small garden area in front of my house. I love to raise roses. I have a 8'x25' vegetable garden in my backyard, also some rose bushes outside the veggie garden. In back I have asparagus and strawberries. Each fall I beg leaves from my neighbors and lay 30-40 bags of leaves in my gardens. Where practical, I roto-till leaves into the soil. My goal is to remineralize this fall. Next growing season I would like to increase the yield about 40%.9 (Alternate is needed to edit: Have a small backyard garden. Added 50 bags of

leaves in past 2 years to 8'x25' veggie garden. Want to increase yield- remineralization should do it.)

Leslie Plaisance

2209 North First St
Golden Meadow, LA 70357
(504) 475 6664

Housewife, gardener, interested in future of life on earth. Vegetarian, meditator. Studied history of science, agricultural etc. Degree in history and languages.

Sharon Joy Sands

5217 Tucson Circle
Fair Oaks, CA 95628
(916) 962 2683

I am a macrobiotic, amateur gardener, registered Nurse; certified massage technician; certified Infant massage instructor, concerned Mom and wife.

B. J. Tudja

Apartado Postal 445
Patzcuaro, Michoacan
Mexico

I am a retired dairy farmer from upstate New York working in Mexico on projects involving soil remineralization, introducing multi-purpose leguminous trees, reforestation. Am using some of Fukuoka's methods in pelleting seeds and inter-planting. Since I am starting trees from seeds, I have no results yet to report.

Debra C. Vuckovich

Society For An Extended Ethic
1139 Woodside Trail
Troy, MI 48098
(313) 828 4179

editor: **Key networker** in Remineralization Network and animal rights activist.

Fred Bernard Wood

2346 Lansford Ave.
San Jose, CA 95125
(408) 723 7818

Member of **The Earth Regeneration Society, Earth Regeneration Corporation and Computer Social Impact Research Institute.**

Solar or Ice Age? Bulletin

The Survival of Civilization Crisis Report

Issue No. 10, October 1989

"*Solar or Ice Age? Bulletin* is a product of a deep love and respect for life and the Earth. ...a unique genius in this time of fragmentary, non-ecological thinking and acting... John Hamaker... has given much of 3 decades to understanding Earth's operation as a Biosphere and how we can live constructively, co-creatively, healthfully, symbiotically as the sane alternative to the time-tested ways of 'living unconsciously, irresponsibly, unnaturally... We might all share a 'moment' of sorrow for the destructivity which our collective 'unconsciousness' has brought forth..before moving ahead, our 'face toward the Sun', with the Earth Regeneration Work we'll share should we honestly desire to prove ourselves a viable and enlightened part of Creation. The work of the 1990's, friends, and we're all invited! In fact, attendance appears mandatory..."

Don Weaver

Suggested minimum donation for issue #10 is \$10.00 to cover costs. Donations urgently needed. Checks best made to *Solar or Ice Age? Bulletin*. Send to editor: Don Weaver, Hamaker-Weaver Publishers, Box 1961, Burlingame, CA 94010 (415) 347-9693. The new issue is 366 pages with many **Comments** by John Hamaker and information on recent climatic and Earth upheaval plus regeneration efforts worldwide.

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The aim is to network around the world where remineralization can offer ecological self sufficiency in place of dependency on unhealthy chemicals, pesticides and herbicides. Remineralization needs to take place worldwide.

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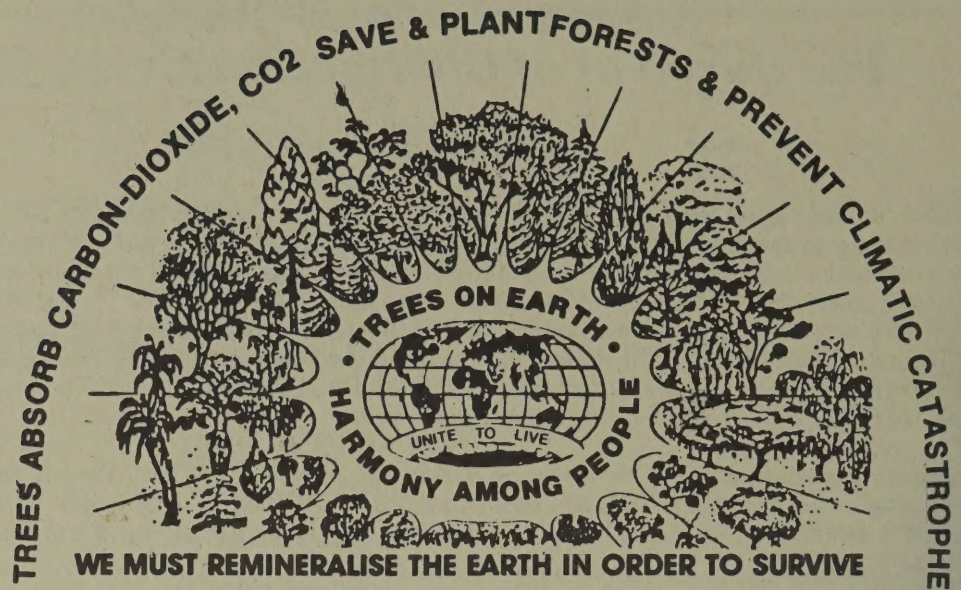
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A NETWORK NEWSLETTER**
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152 South Street
Northampton, MA 01060